Western Industry

January 1953

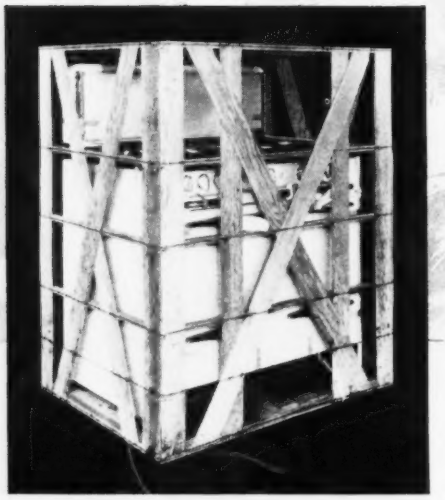
The Facts YOU NEED

AND CAN USE

About the industrial West. Its progress, its prospects, its markets for your products and services. That is the special function of this issue. The overall picture, plus 63 of its industries analyzed for output, trends, materials, equipment, methods

5th ANNUAL REVIEW and FORECAST

Cabco engineers constantly test, test, test. No custom tailor is more critical of size, fit, strength.



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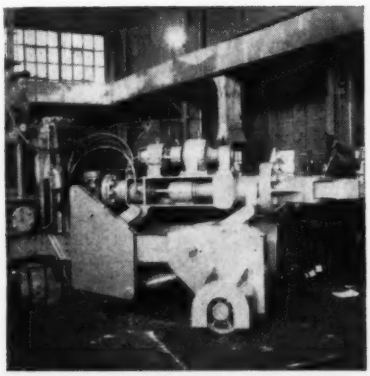
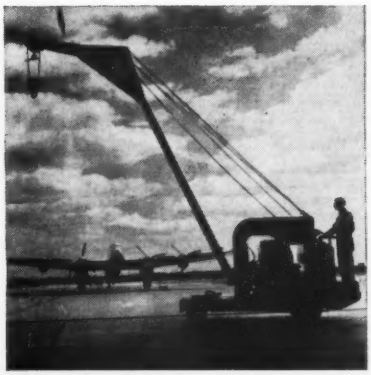
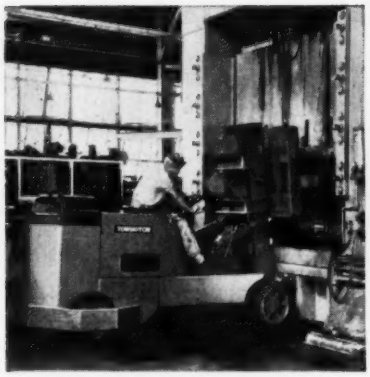


What type tire is best for this job?



Which tread compound wears longest?

How do you determine the right size tire?



What tread compound is best for extra-heavy loads?

Need tires to resist cuts and bruises?

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Western Industry

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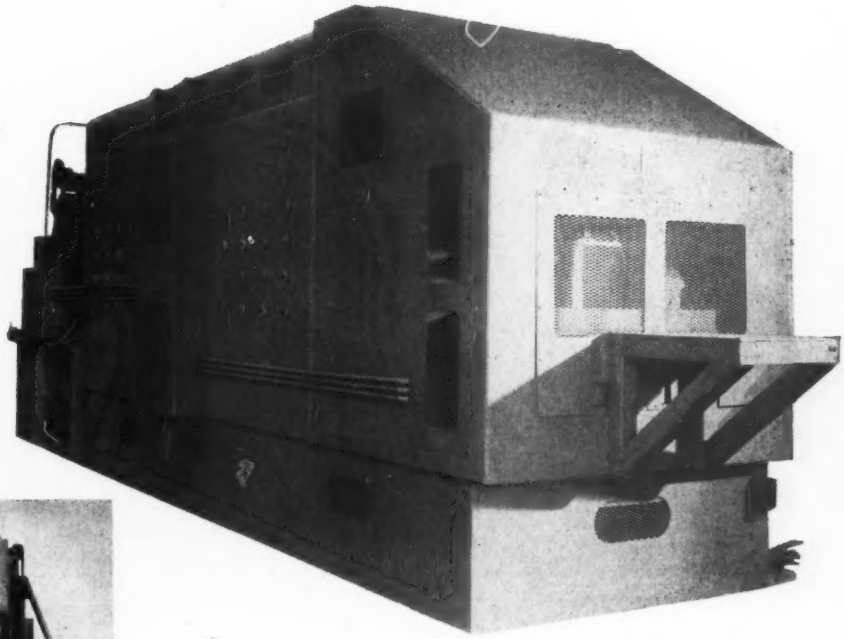

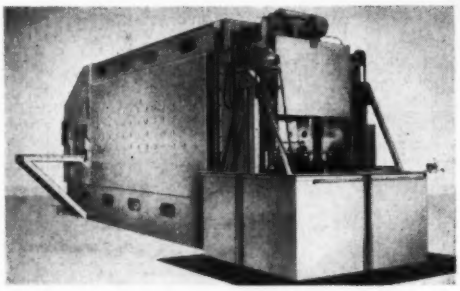

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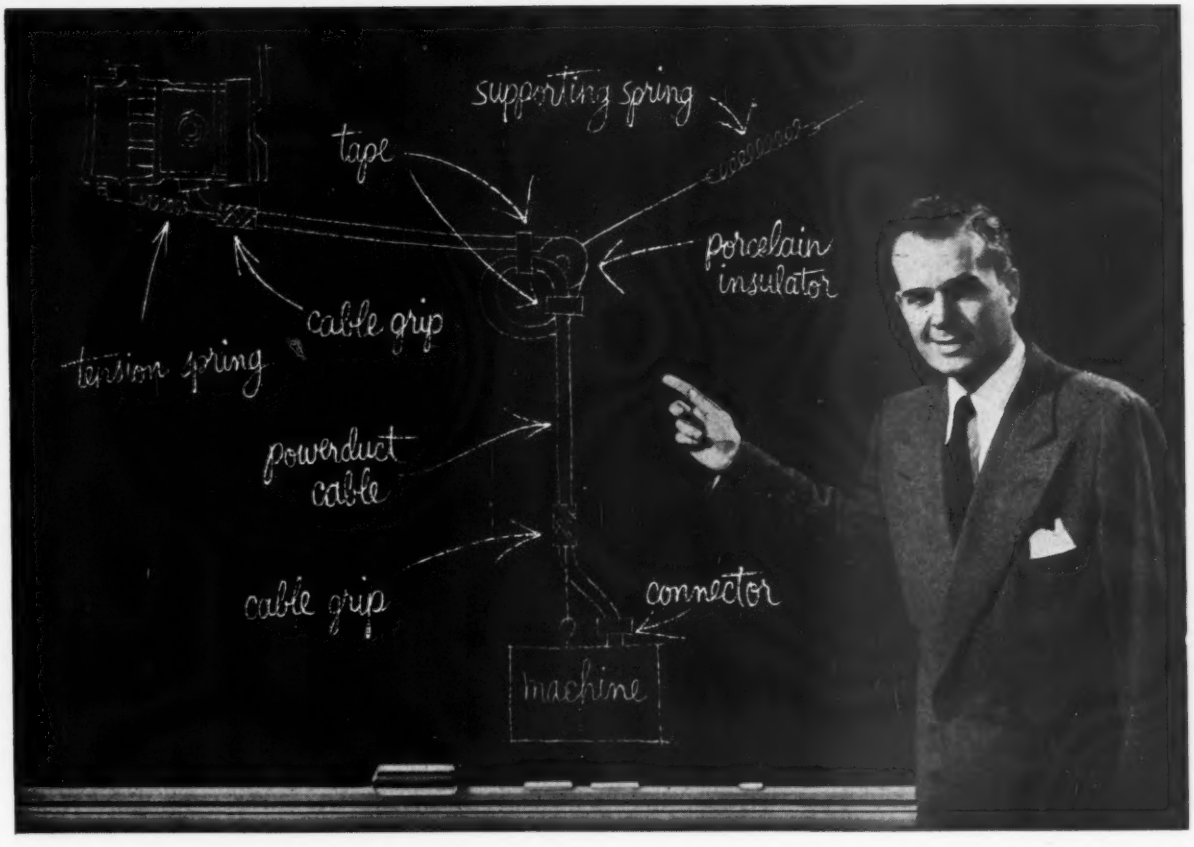

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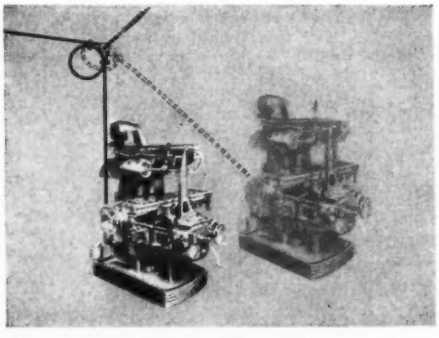

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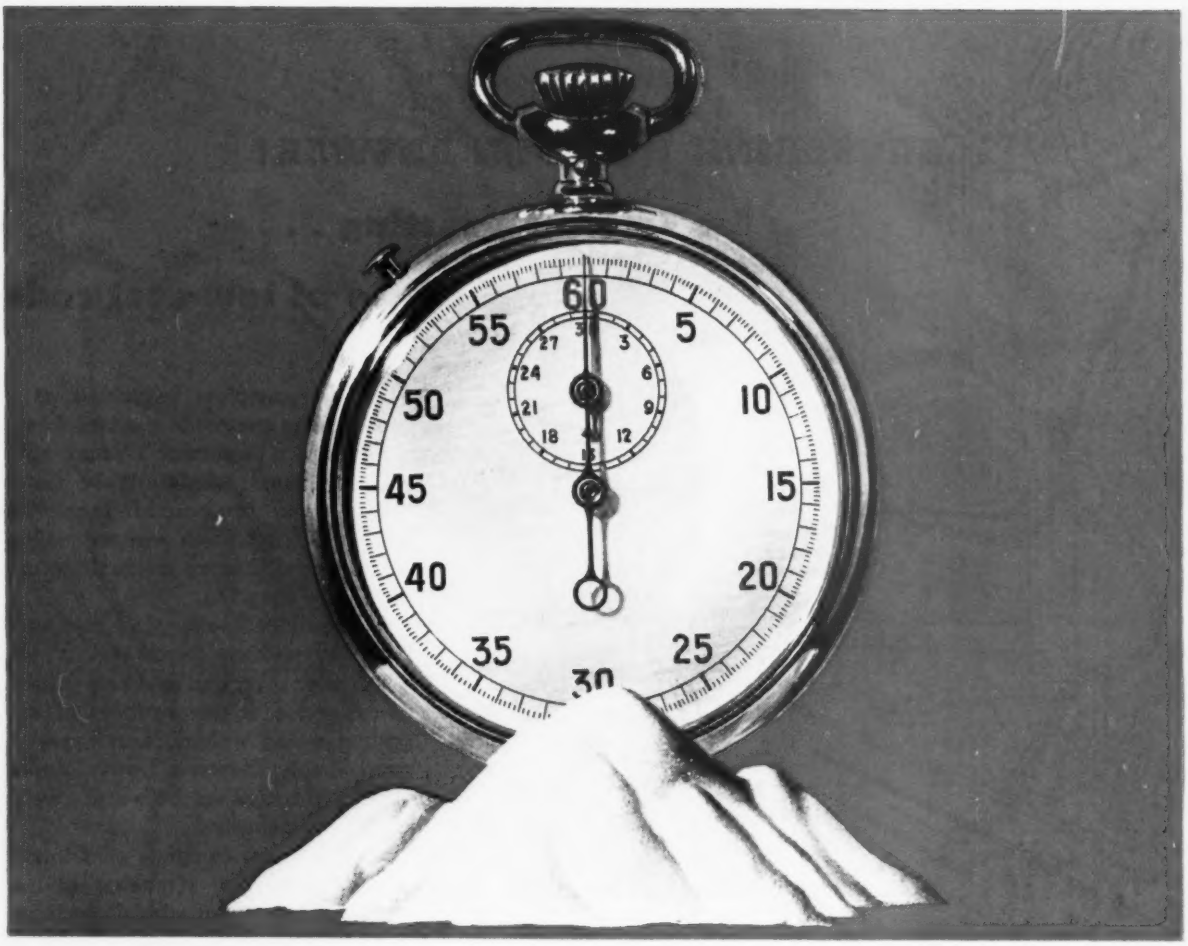

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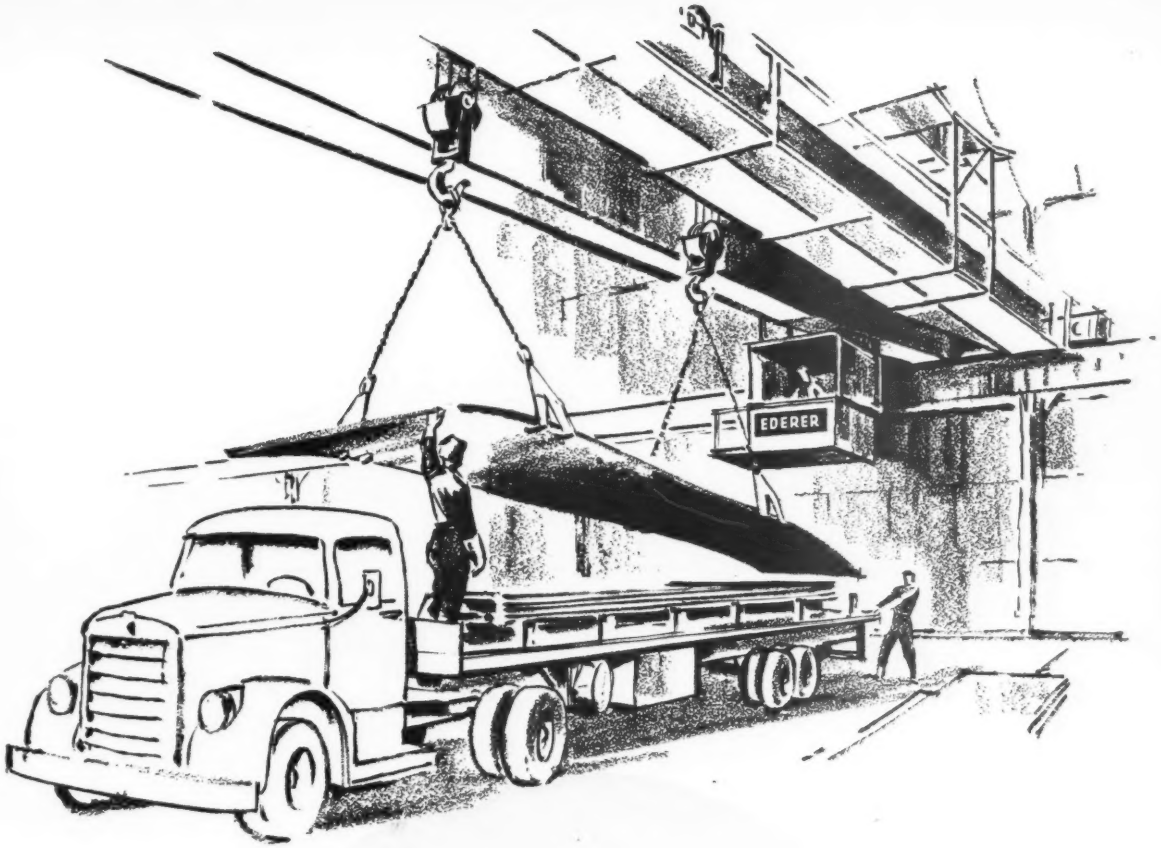

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EDITORIALS

What the West Needs Most

MORE THAN all else, as we see it, the West needs means of communication. More than water, fuel, energy, markets, management methods, it needs facilities for exchanging information and ideas about the West.

Factors which profoundly affect the trend of the entire West's industrial growth are unseen or overlooked by all save a few who are in a particularly advantageous spot for observation, and the favored observers in one instance are a part of the ignorant majority in the next.

For example, the prospective U. S. Supreme Court adjudication of the Colorado River controversy may shape a much wider economy than just the Pacific Southwest. If the ICC alters the freight rate structure, a new market may be set, but who is looking forward to such a day?

These things already loom on the horizon. Many more are bound to come. Yet despite the crying need, nowhere do we find a forum to discuss such situations on a basis of their interest to the whole West. At its birth in Salt Lake City in 1945, the Western States Council gave promise of doing such a job, but it has since relapsed into a minor channel of information for chamber of commerce managers. The Northwest Trade Association does an excellent job for one segment of the West, and the fuel and energy panels of the California Manufacturers Association are highly informative, but there the story ends.

The usual objection raised to an all-Western forum is that the West is too vast, too diversified in interests, for anything of this kind to be practical. Yet we have coming into being a distinctly different Western economy, a distinctly different way of life, which constitutes a uniting and perhaps dominating force. Cannot a way be found to share the essential knowledge about the West so that all may benefit?

Interpreting the West's Development

THIS FIFTH annual Review & Forecast Number of *Western Industry* goes far beyond its predecessors in presenting an adequate informative and analytical summary of industry in the West. Many readers already have found it highly valuable in determining market potentials, and it is our primary aim to make it of increasing service. Suggestions for improvement of this special and unique number are highly welcome.

This picture of the industrial West could become still more graphic and helpful if individual companies were to interpret some of the facets of Western development; perhaps an evaluation of what their customers have accomplished, plus the most important problems that lie ahead. We do not recollect ever having seen advertising copy of just this nature, but it could be very helpful in promoting the development of the West.

Mental Metric System

WHAT a job-lot of unrelated pounds, long and short tons, gallons, feet, acres and what-have-you, the system of weights and measures used by the English-speaking countries constitute!

Just a lot of bad habits that we have failed to shake off is what these weights and measures really are. How much easier the metric system would be, yet how unlikely it is that we will ever adopt it, because our habits are so fixed and so monumental would be the task to make the change.

What is a habit? Is it the failure to think, or the unwillingness to act, when decisions have to be made? Or is it the utilization of a mental metric system based on a single satisfactory motive? We can either be creatures of habit, or we can create good habits.

How about, as a New Year's resolution, each one of us adopting a mental metric system for 1953 by resolving unrelated job-lots of thoughts and deeds into a uniform system of conduct?

"We standardized on SKIL Drills for low maintenance, local factory service,"

—says **Roy Berger,** factory manager
CASTLE INDUSTRIES, INC.
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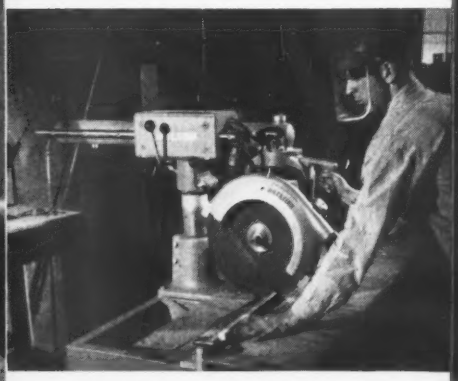
"We use 25 Model 47 SKIL Drills constantly in our sub-assembly of aircraft parts and manufacturing of precision stainless steel and aluminum products," says Mr. Berger. "We give portable tools long, tough use, and *must* have parts and repair service available. The local SKIL Factory Branch Office is the answer. However," he continues, "due to SKIL quality, maintenance has been very low, performance has been the best! SKIL Drills are first-rate—light-weight and compact, ideal for aircraft production."

Ernest Brevik uses SKIL Drill Model 47 with floating drill guide in assembly work. He says, "Compact size of this SKIL Drill makes jobs like this possible. They have more power for their size than any drill I've used."

John Huber uses the SKIL Pneumatic Drill, Model 1013, to drill rivet holes in a door assembly. There are now 32 models in the SKIL line of air tools. Unequalled for compactness, low maintenance, durability.



Charles Hupe cuts steel tubing with the SKIL Radial Saw, Model 450. He says, "We also speed work and insure accurate cutting by using this great tool to saw aluminum extrusions, plus wood and trim parts."

SKIL Drill—Model 47
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Des Plaines, Illinois

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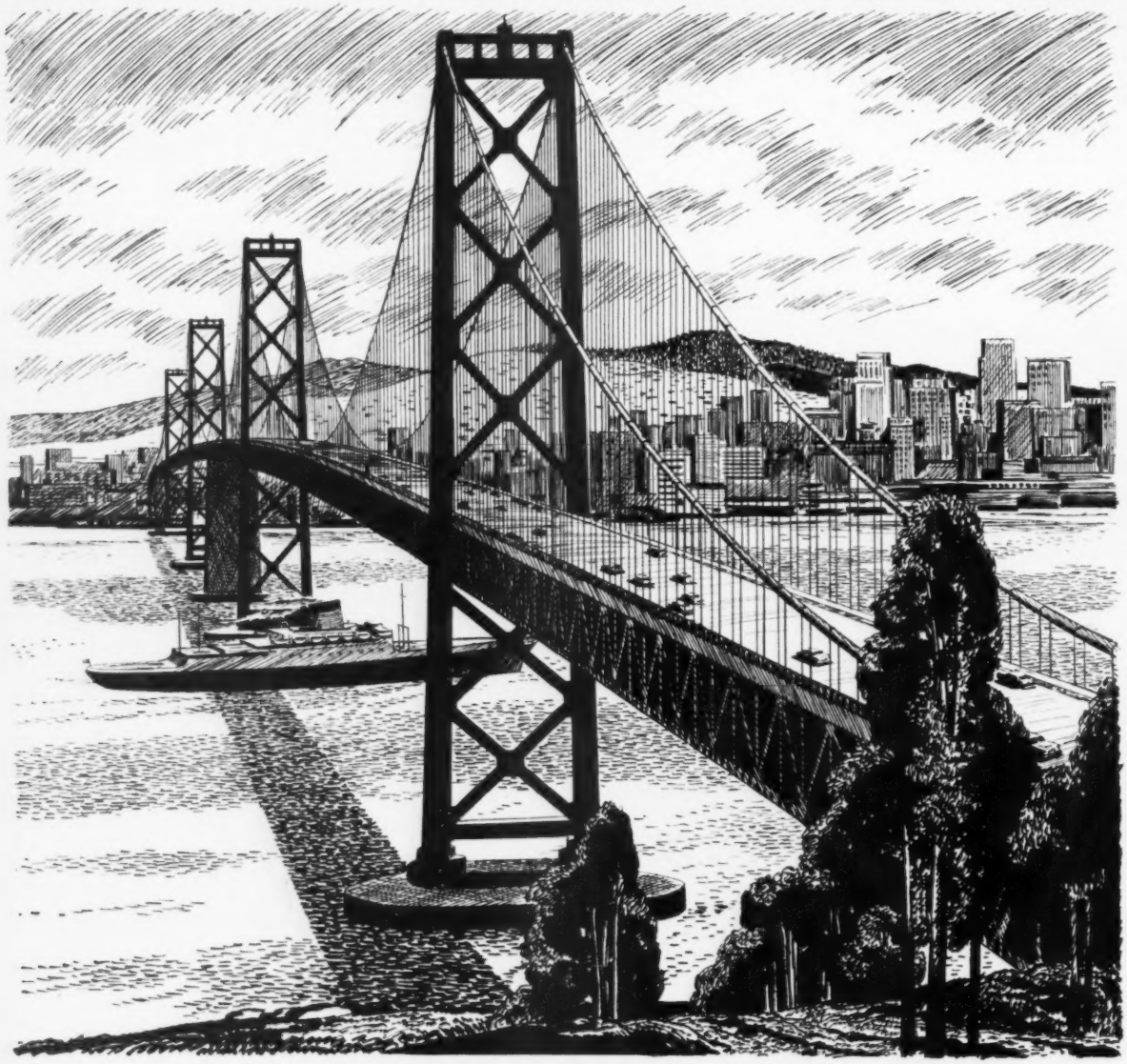
Columbia-Geneva STEEL AT WORK IN THE WEST—The San Francisco Bay Bridge, longest in the world



74% OF THIS STEEL came from Columbia-Geneva!

Of the 201,000 tons of steel that went into the San Francisco Bay Bridge, 149,000 tons—or 74%—came from Columbia-Geneva Steel.

This included steel of all types—structural steel, reinforcing steel, and steel wire for cables.

Big problems . . . small problems—You may not have a "Bay Bridge" to build, or ever need the quantity or many types of steel that it required. But when you think of steel for any job, big or small, think of Columbia-Geneva. It is the West's largest steel producer and is a member of the industrial family that serves the nation—United States Steel.

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the modern *improved* plastic pipe —manufactured on the West Coast

Flexible

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is "top performance" pipe in these fields—

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- Cold water systems
- Drainage
- Farm and well piping
- Ventilation conduits
- Electrical conduits
- Corrosive pipe applications

Semi-Rigid

SERIES #330

has "top rating" in these fields—

- Gas and oil fields
- Irrigation
- Waste and drainage
- Transmission
- Sprinkler systems
- Wineries and beverages
- Corrosive pipe applications

WHY PlastiPipe is *better* pipe

PlastiPipe is light weight, 7 to 15 times lighter than steel pipe. It is a non-conductor of electricity, unaffected by electrolysis; it resists paraffin build-up; and in tests covering three years in farm and in industrial service installations, as well as a large number of commercial uses, it has thoroughly proved its endurance and utility. Sold through leading plumbing wholesalers.

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Send for further information NOW!

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Please send me booklet on PlastiPipe
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LETTERS

Contributions to this column from our readers are welcome. Names will be withheld from publication if so requested. Unsigned letters, however, will be disregarded.

Anyone Interested?

Editor, *Western Industry:*

We would appreciate it very much if you could give us the names of any consultants or firms who specialize in the preparation, writing and illustrating "instruction or operating manuals."

RICHARD BENNETT
City Engineer's Office
Phoenix, Arizona

(Can any of our readers help Mr. Bennet? We regret our inability to take care of him.)

* * *

Pelletizing Oxidized Asphalts

Editor, *Western Industry:*

Do you have any references in your files concerning the pelletizing of oxidized asphalts? One of the Standard Oil units has a pelletizing operation in Casper, Wyo., and may have released information concerning its operation to some of the oil and industrial journals.

We have a plant in partial operation, but are not getting expected results. We would appreciate any information you may have on the subject.

A. M. LOCKHART
Envoy Petroleum Company
Long Beach 6, Calif.

(Can any of our readers help Mr. Lockhart?)

* * *

Nice Trip, but . . .

Editor, *Western Industry:*

. . . The fact that I went to Washington as a member of the so-called Advisory Committee was nothing but a joke, except it gave me a good chance to see Washington.

The meeting I attended was a typical congregation of Democratic bureaucrats. There were about ten business representatives and 20 government people. Of these, three opened their mouths. The others sat and yawned, although I got the impression that for most of them this meeting was their principal excuse for drawing a month's pay. Nothing of any importance was accomplished.

(NAME WITHHELD)

(From one of the members of a National Production Authority Industry Advisory Committee.)

(Maybe it will be different from now on.)

* * *

Disaster Defense

Editor, *Western Industry:*

We would appreciate receiving tearsheets of the article entitled "Disaster Defense on a Practical Basis" which appeared in your November 1952 issue.

This material will be placed in our library for use of faculty and trainees attending Western Technical Training School.

KARL F. KOENIG
Business Manager
Federal Civil Defense Administration
Western Training Center,
Saint Mary's School
Saint Mary's College,
California.

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24

New Powerful Weed Killer Cuts Fire Hazards

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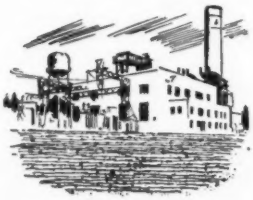

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KEEPS GROUND BARE OF WEEDS AND GRASS

Du Pont CMU kills weeds and prevents regrowth. It controls most species that are a problem around West Coast industrial locations, and it is easy to use because a little CMU goes a long way.

- Eliminates fire hazards caused by unwanted vegetation. Applied just before or during the rainy season, it stops growth early for dry-season protection.
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- Economical, low application rates keep ground clear through an entire growing season or longer.
- Kills most broad-leaved weeds and grass at any stage of growth. Best results for the money come with early applications just before or during the rainy season before weed growth starts.
- Comes as a powder to mix with water. Non-flammable, non-volatile, non-corrosive to equipment.

Where do you want to kill weeds?

Wherever vegetation is an eyesore, or is causing a fire hazard or a maintenance problem, CMU is an effective means of control. For full details, mail the coupon.

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( ) Please have a Du Pont technical serviceman call to discuss my special weed-control problems.

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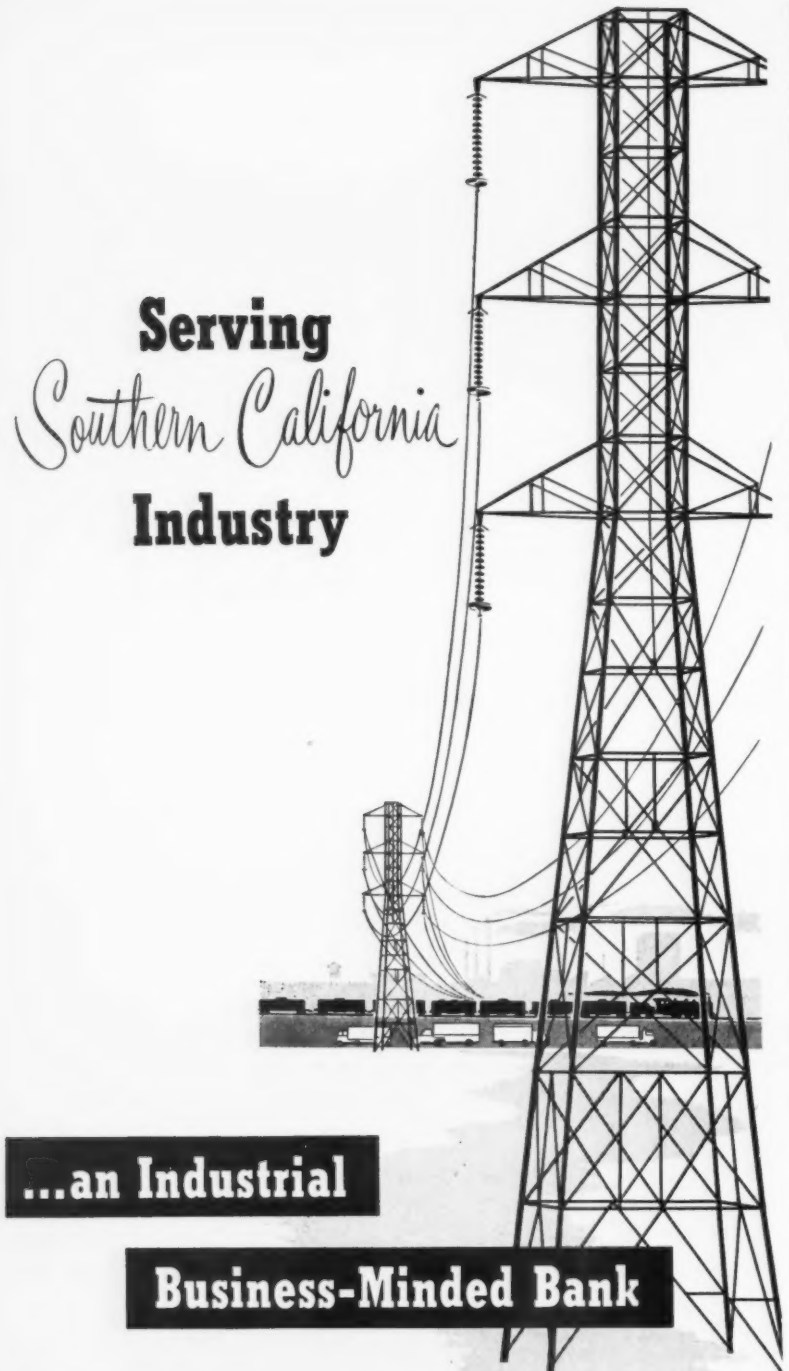

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CALENDAR OF MEETINGS

JAN. 30-31—*Industrial Engineering Institute,* University of California, Berkeley.

FEB. 2-3—*Same institute,* UCLA, Los Angeles.

FEB. 2-6—*National Association of Corrosion Engineers,* five-day course in corrosion, at University of California, Berkeley.

FEB. 4-6—*Western Computer Conference* at Hotel Statler, Los Angeles. Contact George H. West, Sycamore 4-7154.

FEB. 4-6—*Transportation and Traffic Engineering Institute,* 1953 California state banquet at Berkeley, Calif. Contact Bob Glenn, Bldg. T-7, University of California, Berkeley 4.

FEB. 6-7—*American Foundrymen's Society,* California regional conference, Claremont Hotel, Berkeley. Contact John Bermingham, E. F. Houghton & Co., Quint and Davidson Sts., San Francisco.

FEB. 9-10—*California and Nevada Manufacturers of Carbonated Beverages,* state convention at Coronado, Calif. Contact Geo. Culley, 20 S. 1st St., Alhambra, Calif.

FEB. 9-20—*Industrial College of Armed Forces,* national meeting in San Francisco. Contact Colonel Ralph H. Sievers, USA Advance Officer, Industrial College of Armed Forces, Washington, D. C.

FEB. 11-13—*Western States Meat Packers Association,* international meeting in San Francisco. Contact E. F. Forbes, Western States Meat Packers Association, 604 Mission St., San Francisco.

FEB. 12-13—*Western Frozen Food Processors Association,* San Francisco, ninth annual convention at Hotel Casa Del Ray, Santa Cruz. Contact R. G. Free, Santa Clara Frosted Foods, Santa Clara.

FEB. 12-14—*National Western Mining Conference and Colorado Mining Association,* 1953 convention in Denver. Contact Robert S. Palmer, 204 State Office Bldg., Denver.

FEB. 13-14—*1953 California Industrial Safety Conference* at Statler Hotel, Los Angeles.

FEB. 13-14—*Pacific Coast Renderers Association,* regional meeting, San Francisco. Contact Nels Hamberg, Secretary, 1600 63rd St., Emeryville, Calif.

FEB. 15-17—*Washington Bottlers of Carbonated Beverages* meeting at Ridpath Hotel, Spokane. Contact Ed Smith, Secretary of organization, Seattle.

FEB. 16-17—*Nevada National Association of Vertical Turbine Pump Manufacturers,* semi-annual meeting, Las Vegas. Contact B. A. Tucker, Sec., 301 W. Avenue 26, Los Angeles.

FEB. 16-19—*Oregon Dairy Industries,* state convention in Corvallis, Ore. Contact G. H. Wilster, Oregon State College, Corvallis.

Continued on page 22

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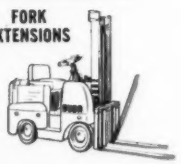

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CALENDAR OF MEETINGS

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FEB. 16-21—*American Institute of Mining and Metallurgical Engineers* at Statler Hotel, Los Angeles. Contact John R. West, 1220 Wilshire Blvd., Los Angeles 17, MAdison 9-2214.

FEB. 20-21—*Los Angeles Chamber of Commerce Institute of Industrial Plant Design,* Ambassador Hotel. Contact Frank Cole, Chamber of Commerce.

FEB. 22-26—*National Sand and Gravel Association and National Ready Mixed Concrete Association,* national exhibits in San Francisco. Contact Vincent P. Ahearn, executive Secretary, 1325 E St., N.W., Washington 4, D. C.

MARCH 5-6—*Western Candy Exposition* in conjunction with conference of candy manufacturers and allied industries from the eleven Western states, Hotel Statler, Los Angeles. Contact conference headquarters, 1366 E. Seventh St., Los Angeles.

MARCH 9-13—*Mayflower Warehousemen's Assn.,* national convention in San Francisco. Contact Mr. O. V. Merrill, Merrill Transfer & Storage Co., 424 Ninth St., San Francisco.

MARCH 15-20—*American Chemical Society,* national convention in Los Angeles. Contact William G. Batt, Franklin Institute, Newark, Del.

MARCH 23-24—*Canners League of California* 49th Annual Directors Conference at Santa Barbara Biltmore Hotel, Santa Barbara. Contact M. A. Clevenger, 64 Pine St., San Francisco. GA 1-3791.

MARCH 23-25—*Intermountain Logging Conference* at Davenport Hotel, Spokane, Wash. Contact Charles Keim, Kalispell, Wash.

MARCH 23-27—*Western Metals Congress and Show,* Pan-Pacific Auditorium, Los Angeles. Contact W. H. Eisenman, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

MARCH 26—*Portland Cement Assn.,* regional safety conference, at Davenport Hotel, Spokane, Wash.

APRIL 8-10—*The Society of the Plastics Industry, Inc.,* SPI Pacific Coast Section Conference, Last Frontier Hotel, Las Vegas, Nev.

APRIL 9-12—*Oil Heat Institute,* Pacific Coast convention. Davenport Hotel, Spokane. Exposition in 161st Infantry Armory. Contact Robt. G. Elmslie, 305 Lloyd Bldg., Seattle.

APRIL 9-10—*Western Cotton Shippers Assn.,* regional convention in San Francisco. Contact Mr. T. J. Harvey, Executive Vice President and Secretary, 108 E. Fourth St., Los Angeles.

APRIL 21-22—*Pacific Coast Management Conference,* at the Claremont Hotel, Berkeley, Calif. Contact California Personnel Management Assn., 2180 Milvia St., Berkeley 4, for additional information.

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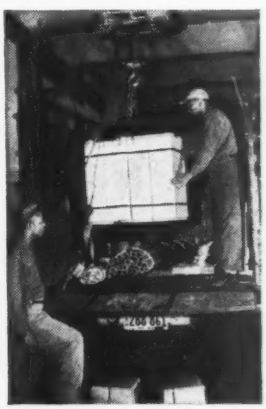

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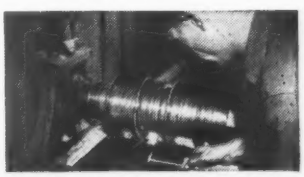

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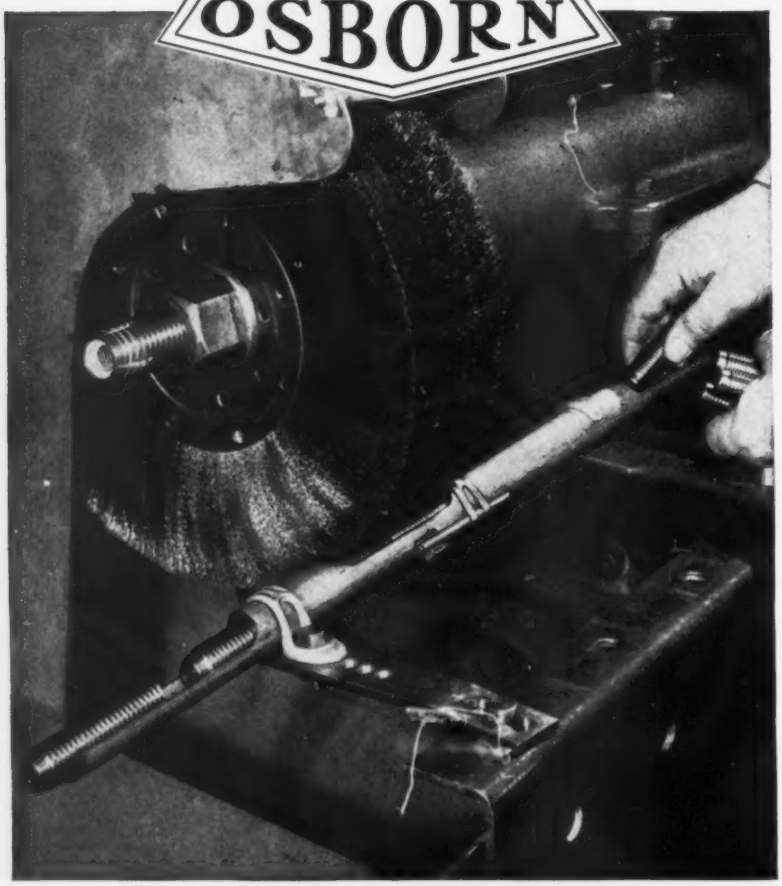

How to find an 800% production increase in a piece of pipe

You can save manpower and money in countless ways when you tap the idea resources of power brushing. For example:

It took 18 seconds to clean the threads of the 2½ x ¾-inch set screws shown above. Time was cut to 2 seconds with Osborn Power Brushing by devising the simple pipe fixture shown. The operator feeds the screws in one end of the pipe and an Osborn brush makes contact with the work at a slot cut in the pipe, spinning and cleaning the threads uniformly. A little stationary wire brush, inserted as shown through the pipe, controls rotation and traverse of the work.

Have your **O**sborn **B**rushing **A**nalyst help you develop and apply output-increasing ideas to *your* cleaning and finishing operations. Call now or write *The Osborn Manufacturing Company, Dept. Q-1, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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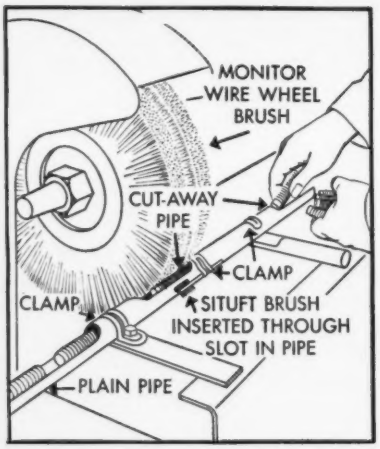
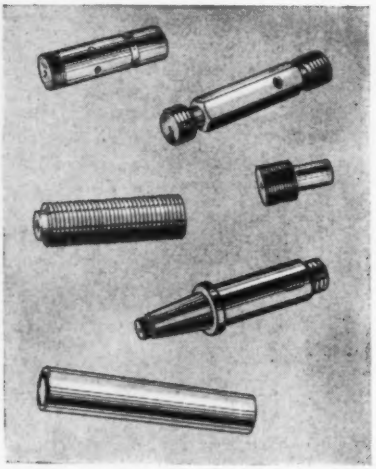
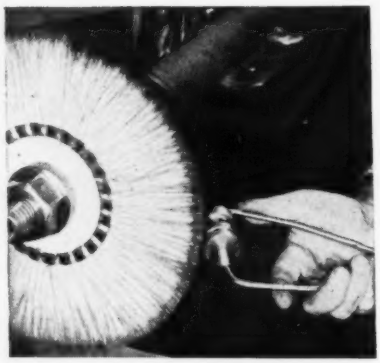


THE FIXTURE. This sketch shows how to make pipe fixture for deburring and polishing small parts, threaded or smooth. Can be made of steel, fiber or plastic tubing.

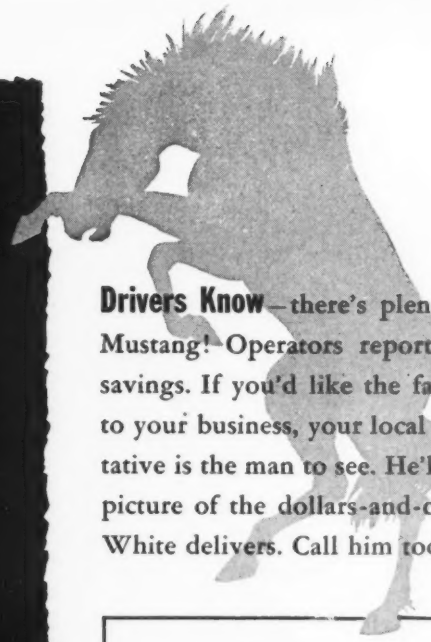


TYPICAL PARTS. Set screws, pins, pieces of tubing and other parts such as these can be cleaned and finished in the pipe fixture or in the forceps shown below.



ANOTHER SIMPLE APPROACH. For small parts such as bushings, a simple forcep fixture can be devised to hold parts for power brushing. This one is made of wire.

-MORE POWER
-MORE MILES PER GALLON
WHITE *Mustang Engine*



Drivers Know—there's plenty of GO in the Mustang! Operators report gallon-per-mile savings. If you'd like the facts as they apply to your business, your local White Representative is the man to see. He'll give you a clear picture of the dollars-and-cents benefits that White delivers. Call him today.

Ask about White Mustang Power for your replacement needs in Whites and other makes of vehicles.

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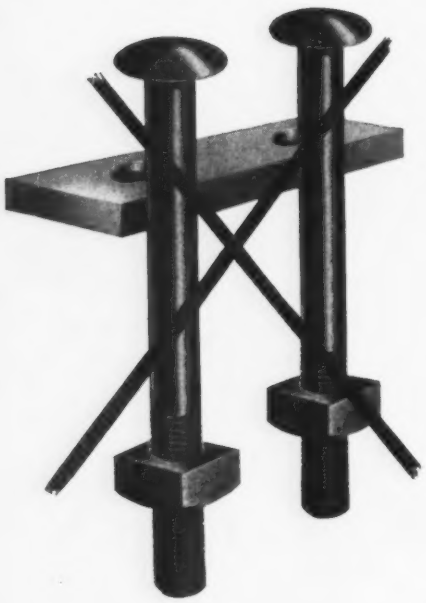

If you analyze the fastening operations on your assembly lines or your construction jobs, you may see places where you could save motions that add up to man-hours, or save materials and improve the design of your product. When this happens, call Bethlehem Pacific for engineering advice. One of our engineers will gladly study your problem and help you design the special fastener you need.

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Our modern new 6.6-acre plant at Seattle will be in operation shortly . . . supplementing our recently expanded plant facilities at Los Angeles. It will offer you fast, efficient service on cold finished round bars from 1½" to 6" . . . with special emphasis on turned and polished bars for line shafting, power transmission, pump rods, bearings, and similar applications.

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All these top quality characteristics are a specialty of Sierra products. To you, they mean less down time on machines . . . better tool life . . . accurate smooth products of better appearance . . . less rejects . . . greater reliability in the products you sell . . . and greater profits in your business picture.

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STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol TR Compound

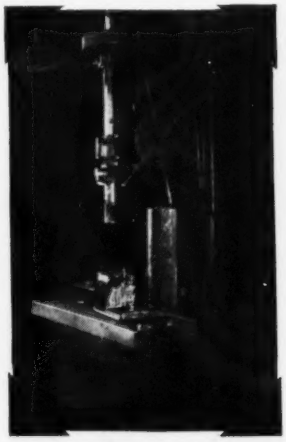
TOOL Heavy-duty tapping machine

LUBRICATOR Brush and swab

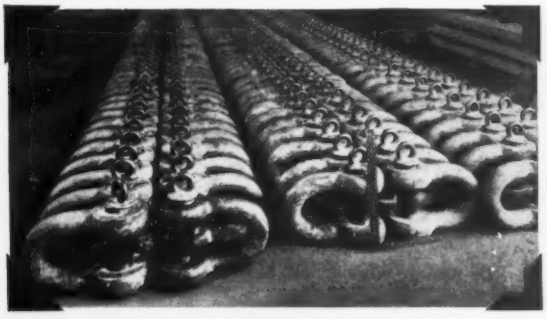
SERVICE Threading 4 inch nuts and shackles

FIRM Schmitt Steel Co., Portland, Oregon

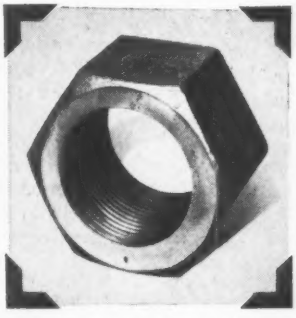
Special tapping compound increases production 43%!



TOOL LIFE INCREASED materially with the switch to Calol TR Compound. Note the excellent condition of this tap. It has threaded 1500 of the shackles and 1500 of the nuts—and is still good for many hours of service. This represents a considerable money saving as replacement cost of one of these large taps is nearly $500. Calol TR Compound also boosted work output. With the better lubrication, the machine could be operated at higher speeds and fewer shutdowns were necessary.



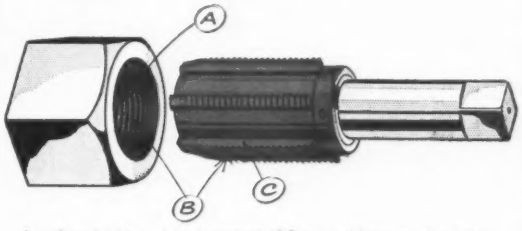
WHEN CALOL TR COMPOUND replaced the usual white-lead-mixture lubricant on 4" taps in the machine at left, defective work was completely eliminated.



Instead of 30 out of every 100 work pieces (big shackles and nuts above) being discarded because of torn or rough threads, all passed inspection.

REMARKS: Besides tapping and reaming, Calol TR Compound is recommended for deep drawing and forming, and difficult metal shaping where ordinary lubricants fail to prevent scuffing or galling. It has the consistency of No. 0 Grease and can be thinned with Calol Cutting Oils.

How CALOL TR Compound ups efficiency in severe metal-working conditions



A. Contains two unusually active extreme-pressure additives—prevents tearing, scuffing, galling of work, promotes good finish.

B. Withstands extreme temperatures—stops welding of tool and work, resists distortion, betters accuracy.

C. Provides good lubrication—allows faster machine speeds, increases production. Easily applied by brush or swab.

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STANDARD OIL COMPANY OF CALIFORNIA

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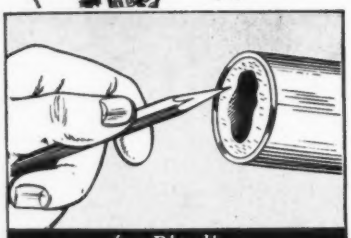
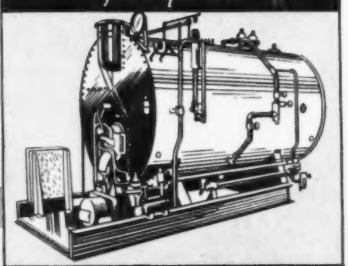
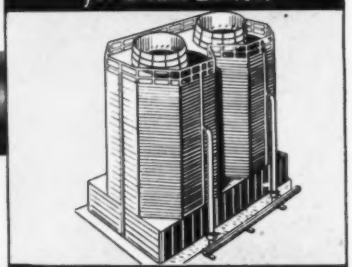


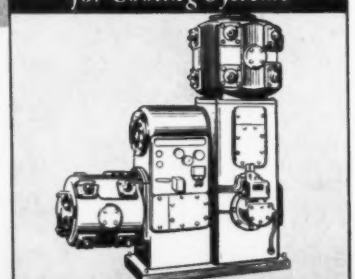
for Pipelines



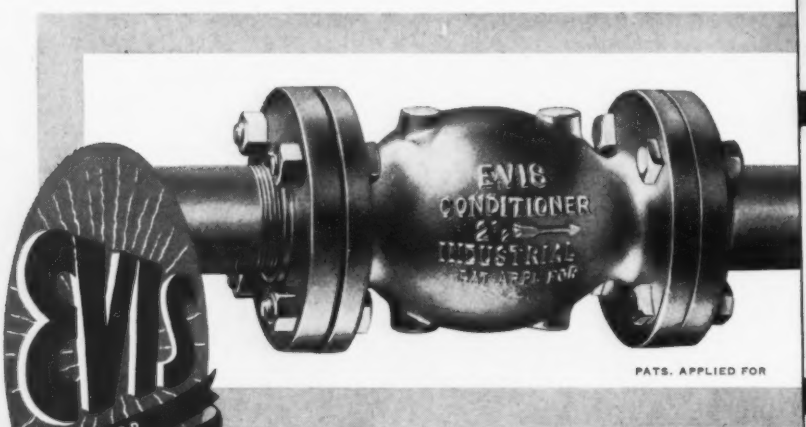
for Steam Boilers



for Cooling Systems



for Engines & Compressors



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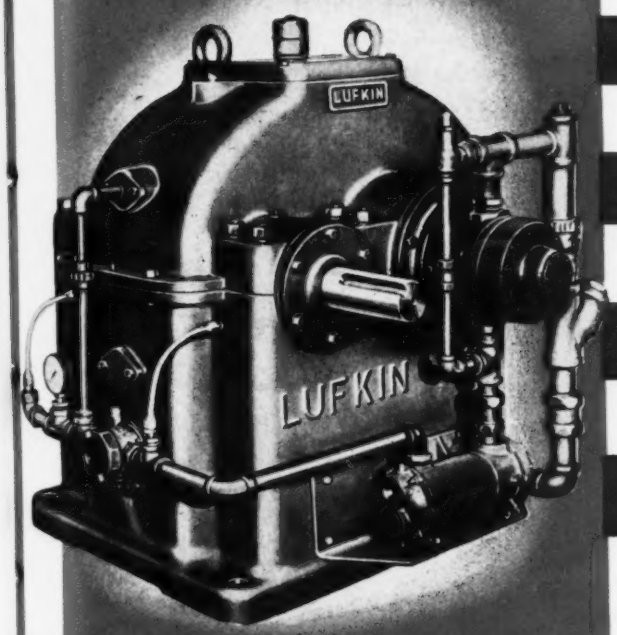

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3 TO 2000 H. P.

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1 TO 1 TO 70 TO 1

ANY JOB

WHERE SPEED IS REDUCED OR INCREASED . . . . . .

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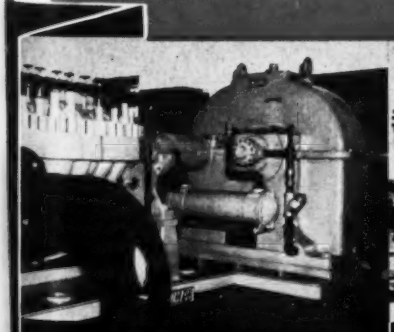
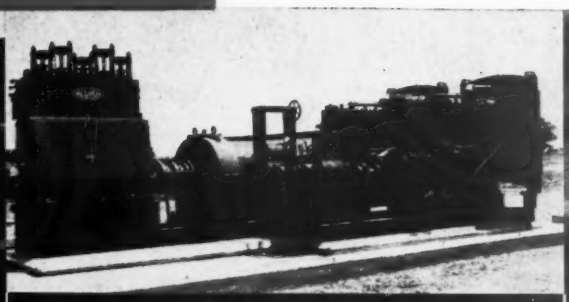


PIPELINE PUMP



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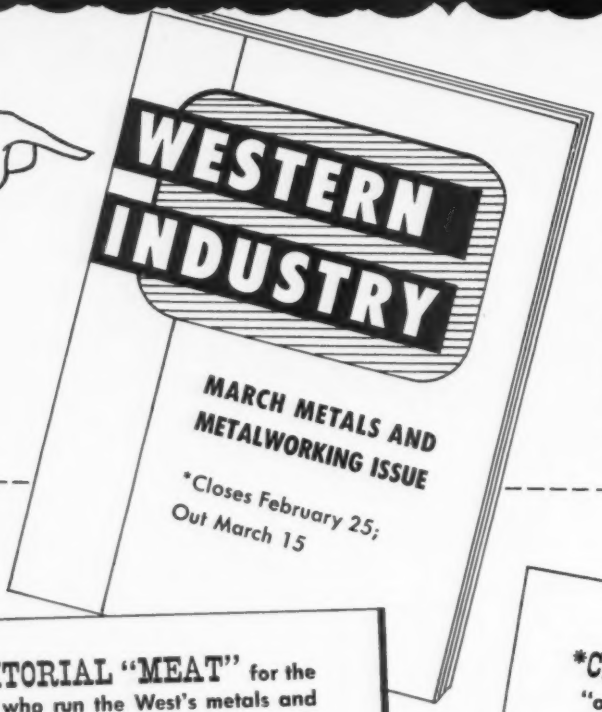

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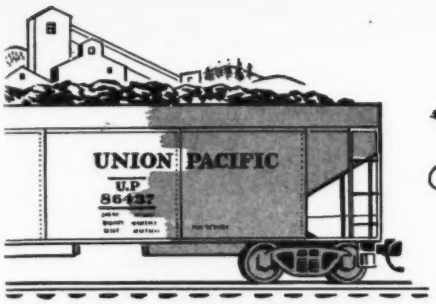
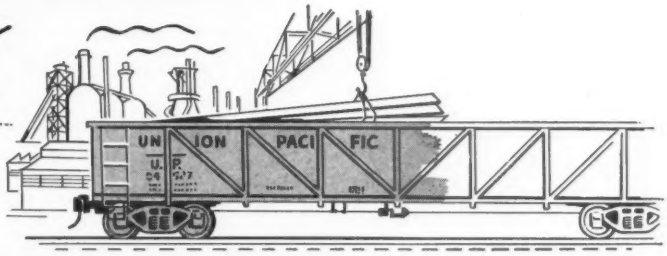
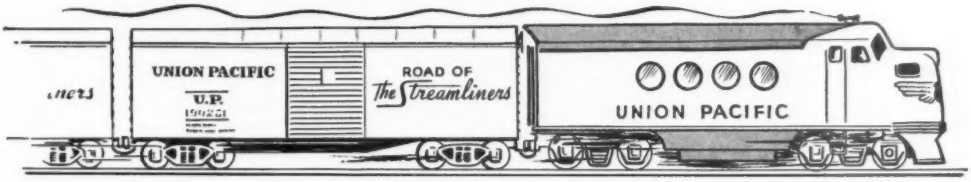


To keep the little woman gay,



To lighten up her chores,



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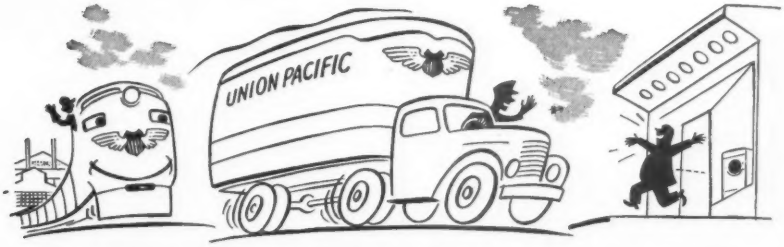

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Western Industry

The Facts YOU NEED AND CAN USE ABOUT THE INDUSTRIAL WEST

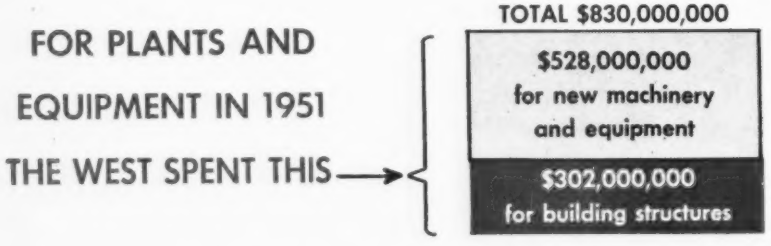
The above text truthfully states the purpose of* Western Industry's *annual Review and Forecast Number, of which this issue is the fifth. It is published because the need exists for throwing light on the over-all picture of the West as an economic industrial region, and for an analysis of the developments and trends of its elements and components. This equips industrialists of all kinds better to understand and take advantage of what the West has in store for them. To* Western Industry *naturally falls this unique privilege and responsibility, and the cooperation of our readers is sought in providing as accurate, comprehensive and illuminating a report as possible. Without their help, very little of what appears in the editorial pages of this issue could have been prepared.

FACTORS THAT MAKE THE WEST TICK . . .

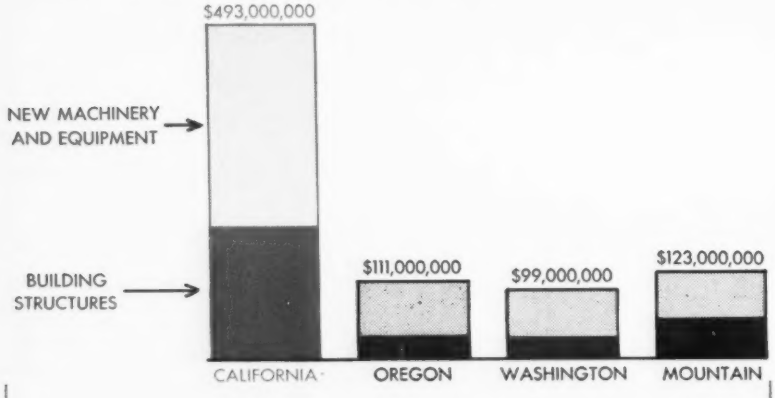
WHAT ARE the prospects for the West? There is no reason to doubt that the present level of greater industrial output than ever before will continue for 1953, but with some variations both up and down.

Apparently the basic sustaining factors in the West are due to remain effective for a considerable period. Meanwhile, the basic economy of the West is being steadily strengthened through an unceasing life-stream of new population, through development of its resources and serving of the increasingly important market that it has become.

No single dominating factor, however, can bring an equal measure of prosperity to all industries and localities. Consequently our readers are referred to the various individual reviews in this issue for specific information. This lead-off article will be devoted mainly to evaluating some of the broader aspects of the Western industrial picture.



..... AND HERE'S HOW THE AREAS COMPARED



EXPENDITURES FOR NEW PLANT AND EQUIPMENT, 1951*
(in millions of dollars)

"$$" indicates total expenditures.
"Struc." indicates expenditures for new structures and additions to plants.
"Equip." indicates expenditures for new machinery and equipment.

	All Establishments			Establishments in Operation	Establishments Under Construction		
	$$	Struc.	Equip.	$$	$$	Struc.	Equip.
MOUNTAIN	123.8	51.2	72.6	107.9	15.9	10.5	5.5
Montana	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Idaho	16.7	3.4	13.3	(1)	(2)	(2)	(2)
Wyoming	12.3	3.5	8.8	6.1	(1)	(1)	(1)
Colorado	31.5	11.9	19.6	31.1	0.3	0.2	0.1
New Mexico	5.0	(1)	(1)	5.0	(1)	(1)	(1)
Arizona	9.4	(1)	(1)	9.5	(2)	(2)	(2)
Utah	25.0	11.7	13.3	25.1	(1)	(1)	(1)
Nevada	1.8	(1)	(1)	1.8	(2)	(2)	(2)
PACIFIC	706.1	250.7	455.5	680.2	26.0	15.6	10.4
Washington	100.8	26.9	74.0	94.8	6.0(3)	(1)	(1)
Oregon	111.6	30.1	81.5	106.4	(1)	(1)	(1)
California	493.8	193.7	300.0	479.0	14.8(3)	8.9(3)	5.9(3)
TOTAL WEST	829.9	301.8	528.1	788.0	41.9	26.0	15.8

*Source: Bureau of Census, Annual Survey of Manufacturers. All figures are rounded from actual reported figures, including totals.
(1) Withheld because estimate did not meet publication standards.
(2) Withheld to avoid disclosure of data for individual companies.
(3) Total expenditures reported by "largest" companies.

POPULATION

The West's continued population growth, which may be the greatest of any area in the country during the present decade, is a greater stimulant to industrial development than elsewhere, for three reasons:

(1) It is due largely to immigration, whereas in other regions natural increase is the main cause. Therefore, it calls for new facilities for food, shelter, transportation, education and recreation.

(2) It increases the population base so materially that industrial operations previously uneconomic can now be carried on safely and profitably.

(3) Natural increase in a long-settled area can be served by existing facilities without much expansion, if any. Therefore, it has comparatively little effect on the economy of the area.

Median estimates by the U. S. Census Bureau for population gains in the four principal regions of the country from 1950 to 1960 are as follows:

Northeast states (New England and Middle Atlantic)	3,154,000
North Central (Great Lakes and northern farm belt)	4,009,000
South (17 states and District of Columbia)	5,319,000
West (11 states)	5,216,000

These figures are projections of past population trends. They indicate that by 1960 the West will have 24,744,000 people, 18,772,000 of them in the three coast states and 5,972,000 in the eight mountain states.

But mere mathematical projections are not necessarily an indication of the future, according to Van Beuren Stanbery, economic analyst at San Francisco for the Department of Com-

merce, who is author of a recent Department booklet "Better Population Forecasting for Areas and Communities."

Census too low

He points out that projections cannot take into account economic changes, such as the settling up of part of the Columbia Basin following completion of the Grand Coulee Dam or the attraction of thousands of employees to the Hanford plutonium works in the same area. The Columbia Basin Interagency Committee took cognizance of this point last summer and declared its view that census estimates for the Pacific Northwest are probably too low.

By the same token, the same reasoning could apply to introduction of natural gas from Canada into the Northwest; also, to the effect on the Pacific Southwest if Arizona wins rights to use of more Colorado River water and financing is developed to transport this vital water to its arable lands.

The effect of population influx is reflected in the fact that much of the West's industrial activity is devoted to servicing the new residents who require food, clothing, shelter, furnishings, utility service, transportation, education, recreation. Consequently, there is need for steel for structures, piping, plumbing, builders hardware and the like, electric wiring and similar equipment, water heaters, gas and electric space heaters, lumber, plywood, wall board, structural clay products, and so on.

Population creates industry

An interesting glimpse of what the settling up of new areas means in the way of markets is given in the following estimates of increases in service and processing establishments that will come in the Columbia Basin area. There land is now beginning to be put under irrigation following the completion of the Grand Coulee Dam.

Using an irrigated developed area in Oregon and Idaho as comparable, W. W. Johnston, project development supervisor for the Columbia Basin Project submits the following figures:

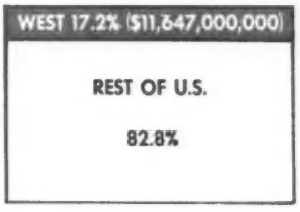
In 1950, the Columbia Basin Project area had 18 manufacturing establishments which added $500,000 annually to the value of products; 83 wholesale trade dealers having gross receipts of $33,800,000, 459 retail stores having gross receipts of $43,800,000, and 615 selected service establishments doing a business amounting to $28,934,000 annually.

With mature development of the entire project of 1,029,000 acres, it is estimated that the Columbia Basin Project area will have 282 manufacturing establishments adding $48,600,000 to the value of the product, 520 wholesale trade dealers having annual gross receipts of $213,800,000, 2,868 retail stores having gross receipts of $276,500,000, and 3,642 selected service establishments doing an annual business of $143,300,000.

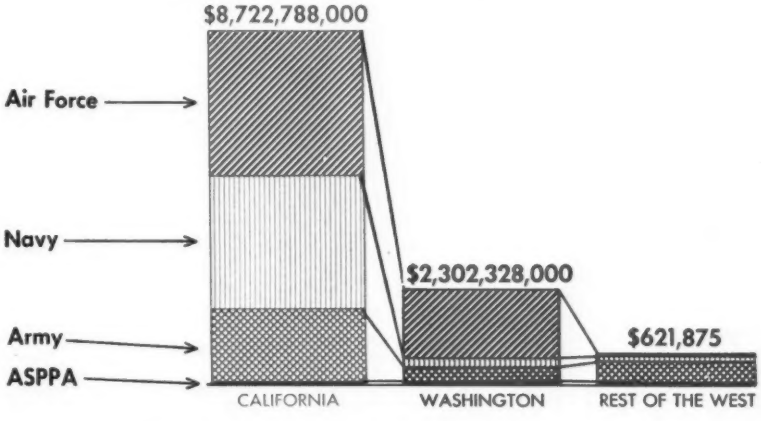
Forecasts of dollar volume are based on 1950 prices.

THE WEST IS GETTING A HEAVY SHARE OF MILITARY PRIME CONTRACTS

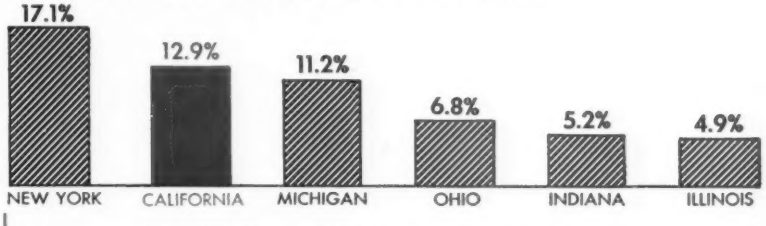
($11,647,000,000 from July 1950-June 1952)



..... THE AIR FORCE IS THE BIGGEST CONTRIBUTOR



... CALIFORNIA RANKS SECOND IN THE NATION



MILITARY PRIME CONTRACTS, JULY 1950—JUNE 1952*
(in millions of dollars)

	Total	Army	Navy	Air Force	ASPPA**
California	8,722.8	1,809.4	3,027.8	3,693.6	192.0
Washington	2,302.3	390.2	191.2	1,720.3	0.5
Oregon	209.5	138.3	45.7	1.7	23.8
Colorado	130.4	103.3	18.6	8.1	0.4
Arizona	103.7	79.7	15.5	8.4	0.1
Utah	53.5	44.3	4.9	2.1	2.4
New Mexico	47.4	40.2	2.9	4.3	0.0
Idaho	27.6	26.6	0.6	0.3	0.0
Montana	19.2	18.4	0.2	0.4	0.1
Nevada	16.3	5.6	10.6	0.1	0.0
Wyoming	14.2	3.8	0.6	0.6	9.3
TOTAL WEST	11,647.1	2,659.9	3,319.7	5,439.8	227.7

Principal States

	Total	% of U. S.
New York	11,620	17.1
California	8,723	12.9
Michigan	7,586	11.2
Ohio	4,611	6.8
Indiana	3,532	5.2
Illinois	3,335	4.9

*Source: National Production Authority. All figures are rounded from actual figures, including totals.

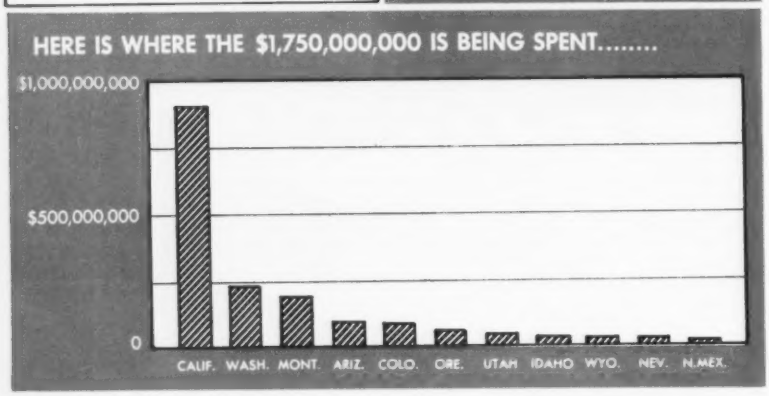
**Armed Services Petroleum Purchasing Agency.

WORLD WAR II LAID THE WEST'S INDUSTRIAL FOUNDATION

($2,500,000,000 in plant facilities from July 1, 1940 to Sept., 1952)

CURRENT DEFENSE PROGRAM ALREADY NEARLY MATCHES IT

($1,750,000,000 authorized by certificates of necessity for fast write-off)



CERTIFICATES OF NECESSITY
1950 to Sept. 5, 1952*
(in millions of dollars)

MOUNTAIN	518.7
Montana	188.7
Idaho	34.5
Wyoming	30.7
Colorado	85.5
New Mexico	21.6
Arizona	89.0
Utah	39.5
Nevada	29.3
PACIFIC	1,198.4
Washington	230.4
Oregon	59.3
California	908.6
TOTAL WEST	1,717.1

IMPORTANT AREAS WITHIN STATES

COLORADO	
Denver	8.0
Pueblo	34.1
Balance	43.4
ARIZONA	
Phoenix	14.2
Balance	74.8
UTAH	
Ogden	0.2
Salt Lake	30.9
Balance	8.6
WASHINGTON	
Longview-Vancouver	15.6
Seattle	27.9
Spokane	22.5
Tacoma	16.6
Balance	147.8
OREGON	
Portland	19.2
Balance	40.1
CALIFORNIA	
Fresno	9.6
Los Angeles	369.1
Sacramento	128.5
San Bernardino	95.1
San Diego	12.1
San Francisco-Oakland	208.8
San Jose	18.1
Stockton	3.3
Balance	64.0

*Source: National Production Authority. All figures are rounded from actual figures, including totals.

Income payments to individuals are widely regarded as directly related to the general prosperity of the area in which they live. Department of Commerce figures show total income payments in the West in 1950 were $31,658,000,000, while in 1951 they had risen to $35,049,000,000. The Federal Reserve Bank reports that Arizona had the largest relative gain in the United States, accounted for by a large increase in agricultural income plus increases in all other sources of income except government.

In the 12th Federal Reserve District, total payments to individuals rose by 14 per cent in 1951, compared with a national increase of 12 per cent, attributed to the substantial rise in manufacturing income.

TRANSPORTATION

Increasing transportation costs are doing two things to the West.

First, they promote development of Western branch plants of Eastern firms. At the same time they enable independent Western manufacturers to compete more successfully with products imported from other parts of the country. Tabulations, accompanying this article, of post-war expansion in California are ample proof of this, as is also the Southern Pacific's report elsewhere in this issue of the number of new plants and expansions along its lines.

Second, higher transportation costs tend to limit the Western manufacturer to a regional market, unless he does what some of his confreres already have done, establish manufacturing operations in the East and Middle West. This trend may be accentuated if the Interstate Commerce Commission goes further in its program of putting all railroad rates on a strictly mileage basis.

Decentralization of industry has made it increasingly less dependent on rail transportation than formerly. Comparative rail and trucking statistics, which show a variable trend in rail tonnage, but a steady uptrend in interstate truck movement, may possibly bear this out although interstate trucking is but a tiny fraction of rail movement.

RAILS SEESAW

Tons of Revenue Freight Originated and Terminated in the Eleven Western States

(In thousands—From Interstate Commerce Commission, Bureau of Transport, Economics and Statistics)

	Mountain	Pacific	Total
1946	85,904	157,420	243,324
1947	103,013	166,925	269,938
1948	99,295	158,618	257,913
1949	89,993	139,821	229,814
1950	97,391	152,013	249,404
	475,596	774,797	1,250,393

TRUCKING STEADILY UP

Entries into Arizona and California

(from Arizona Highway Department and California State Bureau of Plant Quarantine)

	Arizona	California
1948	230,890	169,575
1949	257,386	179,324
1950	341,342	226,851
1951	437,674	272,691
1952 (10 mos.)	485,138	223,896

Highway network

The next few years may see vastly improved facilities for long-distance trucking in the West, which has never had the close network of rail lines characterizing the East and Middle

West, and has a great many communities that grew up without rail transportation.

Various states are finding that pay-as-you-go financing of highways through gasoline taxes is not providing roads fast enough to keep up with the pressure from population growth. Consequently, the trend is toward financing by bond issues, which would greatly accelerate highway development.

AGRICULTURAL PRODUCTION

Agriculture, already more mechanized and factory-ized than anywhere else in the country, will become even more so.

First, because the high value of the irrigated Western specialty crops, with, in many cases, several harvests each year, justifies purchase of specialized equipment.

Second, because of the pioneering, adventurous nature of the big Western farming operators who invest heavily in order to gain higher returns, and significantly though less spectacular, gains in orchard returns.

Instead of rotation of crops, they fertilize thoroughly and keep the same ground producing several crops of the same item year after year, and the farmer of today is far less concerned than formerly with buying additional acreage in order to increase his output. This is exemplified in the fantastic increases in tomato yields in the last few years.

More Western fabrication

One effect of this increased agricultural activity will be greater fabrication of equipment in the West, and the day apparently is not far off when tractors will be assembled in the area just as has long been done with automobiles.

A second effect is greater food processing operations, which, however, are approaching their limits in some cases. While canned fruit and vegetable packers have been able to market big post-war increases in volume so far, higher transportation costs tend to localize canning, just as they do manufacturing operations. California canned asparagus and spinach, formerly almost California monopolies, are finding competition of increased output of these items east of the Mississippi River almost insurmountable.

Nevertheless, specialty items which cannot be produced elsewhere, should continue to prosper.

Another and even more important development is the fact that the ability to raise several crops of the same vegetable every year, plus operations in widely distributed areas, has made California the No. 1 frozen foods processing state in the country. Any crop failure can either be made up for by later crops in the same year, or by yields elsewhere in the state.

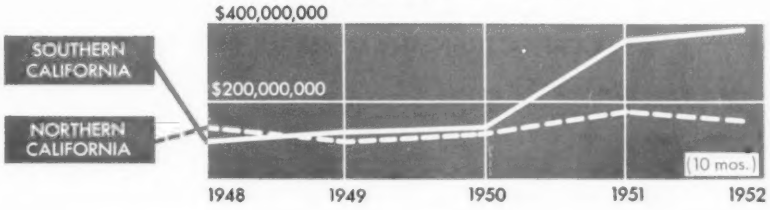
More crops call for more fertilizer, and this has stimulated the mining of phosphates in Idaho, New Mexico and other Western states. Sales of fertilizer in California increased 14 per cent from 1950 to 1951. Another product affected is tinplate. Columbia-Geneva Division of U. S. Steel has doubled its output at Pittsburg, California, and Kaiser Steel Corporation has completed a tinplate mill at Fontana.

Despite the great increase in agricultural output, the West is a deficit area on meat and dairy products, because its farms and packing plants have been unable to keep up with population growth.

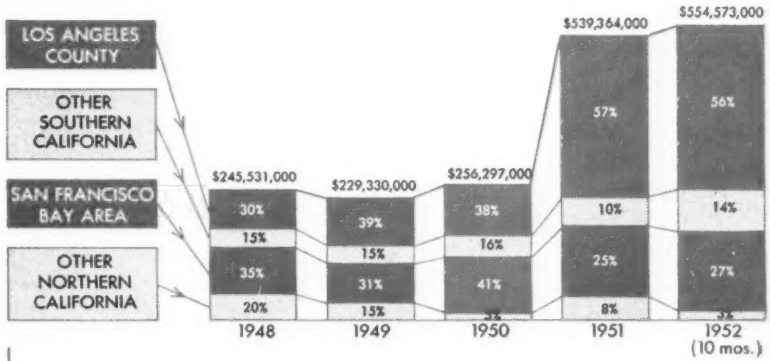
GOVERNMENTAL PROGRAMS

These have had, and will continue to have a tremendous effect on the West's economy. They created an ephemeral wartime shipbuilding industry. They laid a heavy and unexpected foundation in wartime of industrial facilities for the West's postwar growth. This foundation is being deepened and widened today through the quick-amortization inducements offered for currently needed defense facilities.

CALIFORNIA INDUSTRIAL GROWTH DERBY.....
(South finally pulls way out in front)



POSTWAR EXPANSION BIG.... GETS BIGGER.....



CALIFORNIA INDUSTRIAL DEVELOPMENT, 1948-52*

"No."—Indicates number of new plants.
"$$"—Indicates total investment in new plants, and expansions, in millions of dollars.

	S. F. Bay Area**		Other No. Calif.		L. A. County		Other So. Calif.		Total Calif.	
	No.	$$	No.	$$	No.	$$	No.	$$	No.	$$
1948	271	88.5	32	47.9	190	72.1	7	38.8	500	245.5
1949	245	66.3	17	34.1	180	93.4	27	35.5	469	229.3
1950	137	104.1	14	13.7	128	98.4	23	40.0	302	256.3
1951	93	131.9	18	47.6	116	308.3	43	51.5	270	539.4
1952 (10 mos.)	117	151.7	26	19.1	56	308.4	10	75.3	209	554.6

*Sources: Northern California figures, San Francisco Chamber of Commerce. Southern California figures, Los Angeles County Chamber of Commerce. State totals, Annual Survey of Research Dept., California State Chamber of Commerce. All figures are rounded from actual reported figures, including totals.
**Includes 12 counties.
NOTE: In the Portland metropolitan area 50 new industries were reported for 1952 by the Portland Chamber of Commerce, plus 60 expansions. Total investment, $37,000,000.

They have reinstated the aircraft industry on a heavy machine using basis to replace much of the hand operation necessary during the last war. Aircraft is today the West's largest single industry.

Uncle Sam's hand

Governmental programs have founded vast industrial plants, like the Hanford plutonium works on the upper Columbia River. They are developing a huge atomic energy industrial experiment station in Idaho, giant laboratories in New Mexico and elsewhere, and are dotting the sparsely settled Colorado plateau with uranium processing plants.

They have sprinkled, if not heavily showered, the West with scientific men and technical experts. The genius of these men has inspired far-reaching achievements in jet propulsion, guided missiles and electronics, and their influence will be widely felt in Western industry in the future as well as at present.

Last but not least, governmental programs are turning arid areas into irrigated farmland, and providing hydroelectric power for development of the Pacific Northwest. This has fostered aluminum reduction mills and other electro-chemical industries, although the demand for aluminum has so far outrun supply that the general development of the Northwest is being hindered by lack of power for other industrial operations. This winter all large industries in the Northwest are suffering from power cutbacks resulting from severe drought.

The change to a Republican administration at Washington may reduce governmental programs in the West in the long run, although it is difficult to see how there can be any immediate change. Everything due to be spent in the coming year was contracted for long ago.

In the case of aircraft and guided missiles, of which the West has about half the production, out of a total of $40,000,000,000 in funds available, only $10,000,000,000 of the orders have been delivered and only $30,000,000,000 has been contracted for. In the electronics program, out of $10,000,000,000 available, $6,000,000,000 worth of orders have been placed and $3,000,000,000 delivered.

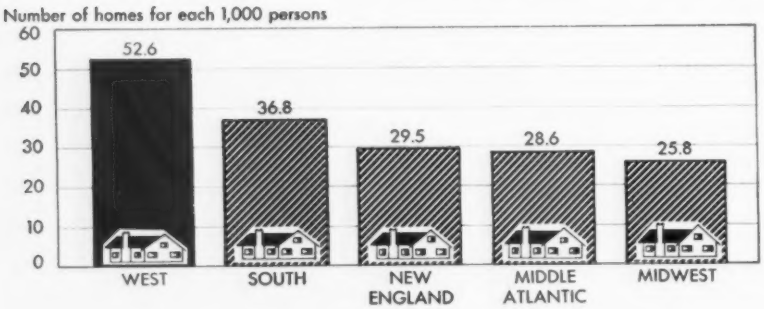
Decentralized authority

There is likelihood, however, of an ultimate trend away from federal financing of electric power projects. Dependence on Congress has caused a bottleneck in appropriations, and it has also put the Bureau of Reclamation in a dominating position resented and feared by many of the people in the West.

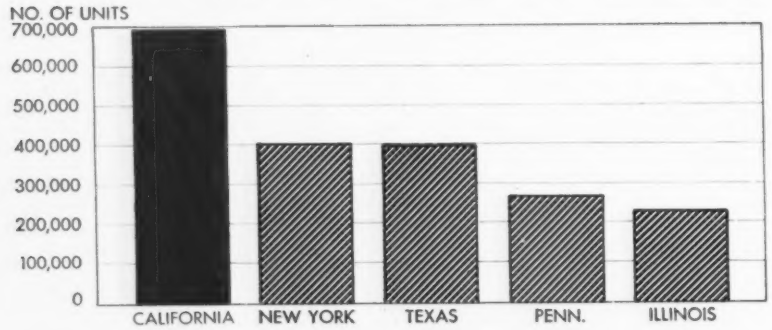
The principal area liable to be affected is the Pacific Northwest, because the Pacific Southwest already has developed most of its economical hydro-electric sources and is relying more and more on steam-generated power. The suggestion of Senator Cordon of Oregon that an "interstate authority" be set up to take over the Reclamation Bureau's subsidiary, the Bonneville Power Administration, which controls the Columbia River system, has received considerable publicity, but at best it can only be something far in the future.

There is also much talk of public utility districts doing their own financing, but the critical projects which would do most to alleviate the Northwest's power shortage are in all probability too big for the application of this idea. A hindering factor to local financing is the difficulty of apportioning the cost of flood control features of these projects.

THE WEST IS BUILDING MORE HOMES PER CAPITA THAN ANY OTHER U.S. REGION



..... AND CALIFORNIA IS BUILDING ALMOST TWICE THE NEXT STATE IN THE U.S. (Total 1948-1951 and 6 mos. of 1952)



Area	Population (1950)	New Homes*	New Homes Per 1,000 Persons
West	19,528,000	1,027,800	52.6
South	47,296,000	1,741,500	36.8
New England	9,393,000	277,000	29.5
Middle Atlantic	30,517,000	881,900	28.6
Midwest	44,938,000	1,159,000	25.8

*New permanent dwelling units started in nonfarm areas from 1948 through first six months of 1952, based on Bureau of Labor Statistics reports. Total new units during this same period for five leading states charted above are: California, 699,500; New York, 400,300; Texas, 396,400; Pennsylvania, 263,100; Illinois, 227,600.

FOREST PRODUCTS

Although every state in the West produces lumber, the output in Oregon, Washington and northwestern California is so great that it dominates the entire economy of those areas. Consequently, dips in lumber prices and production are keenly felt.

Yet the trend of diversification in use of forest products has become so marked that it should not be too many more years before the present lumber areas find themselves considerably less affected by the lumber market alone.

User requirements for lumber are changing, entailing changes that begin to reach clear into the lumber mills so that the mills can no longer consider

themselves simply bulk producers of raw material. Instead, they will become in increasing degree merchandisers of varied wood products.

The most important secondary forest products are pulp and plywood. The demand for paper and other pulp products continues to grow so rapidly that the Pacific Northwest has in a few postwar years become the leading pulp supplier for the country.

As an employment stimulator, pulp and paper rank very low, because these products require very large mills employing comparatively few people, although the addition of hardboard, cellophane and other by-products would help to bring up the employment figures. Plywood output continues to grow, despite cries of overproduction and soft prices.

Flow of trade

On this same page are a chart and table indicating to some extent the flow of trade between the states in the West. The more thickly populated coast states have more goods to exchange with each other and with the Eastern portions of the United States than they do with the sparsely peopled mountain states. If comparative figures with 1940 were available, however, *Western Industry* is inclined to believe they would show a sharp increase.

One reason for this belief is that the coast states themselves have far greater purchasing power than a decade ago, while the resources of the mountain area are being exploited to a far greater extent.

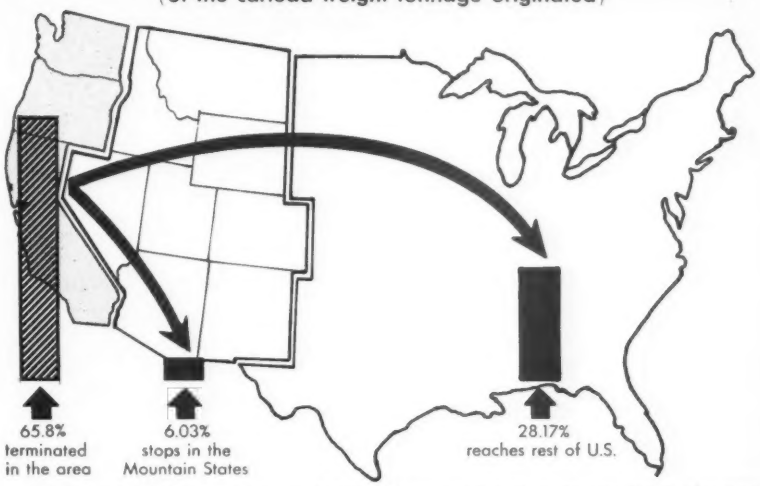
The University of Utah points out that in 1947 Utah began to ship the major portion of its livestock Westward rather than Eastward, because of the increased Western population. In the last decade there has also developed a big trade in dairy products between Idaho and Southern California, while the heavy steel fabricating industries beginning to grow up in Utah because of the proximity of the Geneva steel mill as a source of supply are shipping their products long distances. The phosphates mined in Idaho and New Mexico are finding a big and expanding market in California. On the other hand, Southern California furniture manufacturers have opened up trade for themselves in New Mexico and West Texas as the result of recent freight rate adjustments.

Colorado is experiencing its share of business development, for various reasons. The construction programs at the Colorado Iron and Steel Corporation mill at Pueblo have had their effect on that city. It had a census population in 1950 of 63,685, but the Bureau of Business Research, University of Colorado, estimates that today it has 75,000 people, if not 80,000.

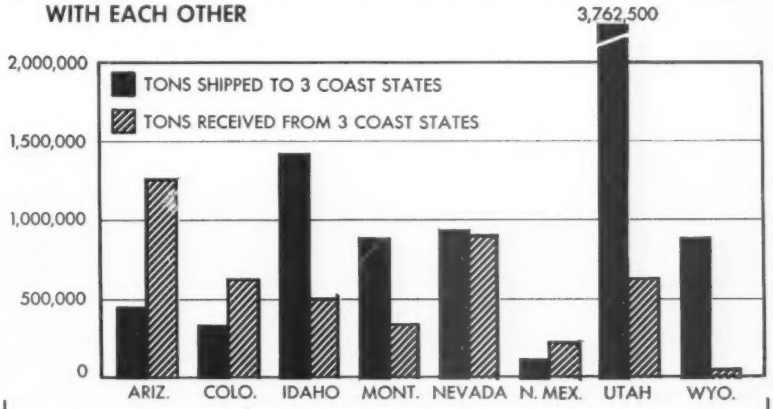
Englewood, a manufacturing center just south of Denver, has grown from 16,689 in 1950 to an estimated 21,000 in 1952. Colorado Springs, according to its chamber of commerce, grew from 45,472 in 1950 to 59,085 last year.

The tremendous postwar growth of Albuquerque, Phoenix and Tucson can also be cited to illustrate the development going on in the Pacific Southwest, a region that promises to bulk much larger in the West's future economy.

PACIFIC COAST STATES ARE THEIR OWN BEST CUSTOMERS
(of the carload freight tonnage originated)



... BUT THE COAST AND MOUNTAIN STATES DO PLENTY OF BUSINESS WITH EACH OTHER



ONE PER CENT SAMPLE TONNAGE OF DISTRIBUTION OF CARLOAD TONNAGE*
(1950)

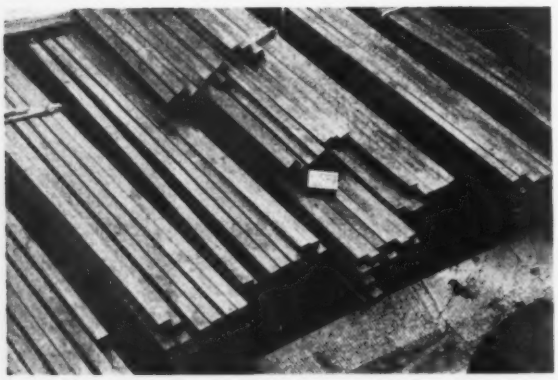
Originating in Pacific Coast States	762,477
Portion of total terminating in	
Coast States	501,773
Mountain States	46,840
Remainder shipped to rest of country	213,864

	Received from Coast States	Shipped to Coast States
Arizona	12,834	4,569
Colorado	6,394	3,467
Idaho	5,222	14,247
Montana	3,691	9,046
Nevada	9,219	9,530
New Mexico	2,298	1,348
Utah	6,387	37,625
Wyoming	795	9,225
Totals	46,840	89,057

*All commodities are included. Source: Interstate Commerce Commission, Bureau of Transport Economics and Statistics.

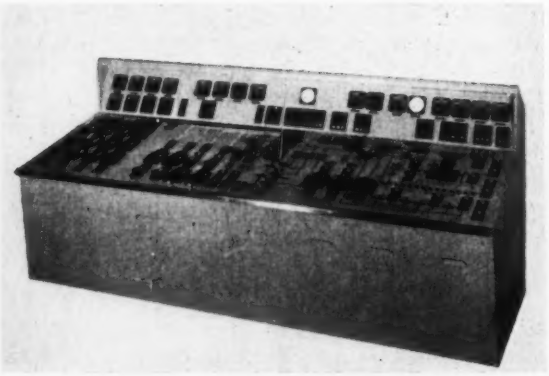
"CONTRIBUTIONS OF WESTERN ENGINEERS to development of the industrial West"

This compelling title of the American Society of Mechanical Engineers, San Francisco Section, Professional Divisions Fall Conference on October 24 last, inspired Western Industry to feature here seven outstanding contributions from the 20 topics presented on that occasion. They are typical of the active, progressive thinking of the West.



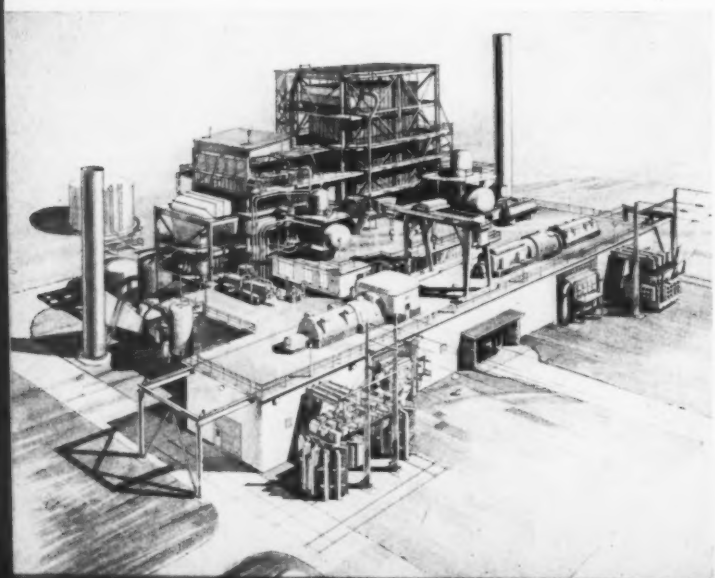
HOLLOW ELECTRICAL CONDUCTORS

Magnet design, using square hollow electrical copper conductor with coolant passage running through the conductor (made by Phelps Dodge Copper Products), results in practically no limitation on current density which may be carried. One design used over 70,000 amperes per square inch. Calculation procedure guide available. Paper presented by L. E. Brown, Radiation Laboratory, University of California.



HIGH PRESSURE INSTRUMENTATION

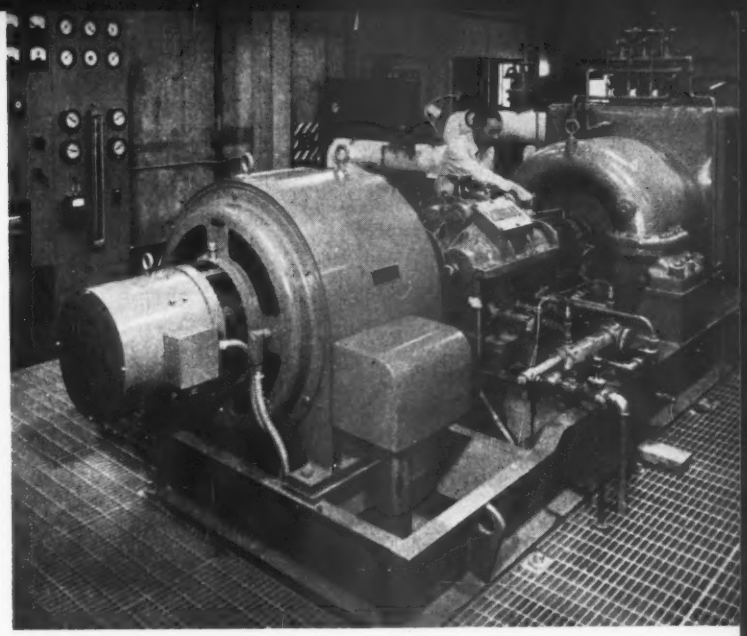
Western engineers, like P. G. & E. and Bechtel, are in forefront of trend to condense maximum information into minimum panel space. In Pittsburg steam boiler installation, largest west of the Mississippi, everything is included within 10 ft. of length. Example of such condensation is Bailey Meter control console (above). The West produces some basic components. Paper by Arthur E. Ericksen, (Bechtel).



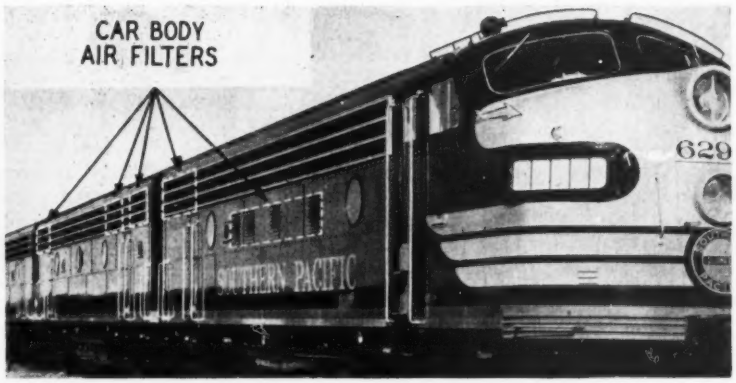
THE POWER PLANT'S CHANGING SHELL

Out-of-doors steam plant eliminates usual boiler and turbine room structures, effecting considerable construction economies. Artist's view (above) of Kyrene Steam Plant of Salt River Power District, Phoenix, engineered and constructed by Bechtel Corporation under direction of Salt River's engineers. Second unit now under construction has further shed the turbine front standard walk-in housing and the enclosure over the boiler steam drum. Paper presented by J. F. Del Curo, I. R. Caraco and J. H. Goodell (Bechtel Corp.).

ATOMIC POWER PLANTS

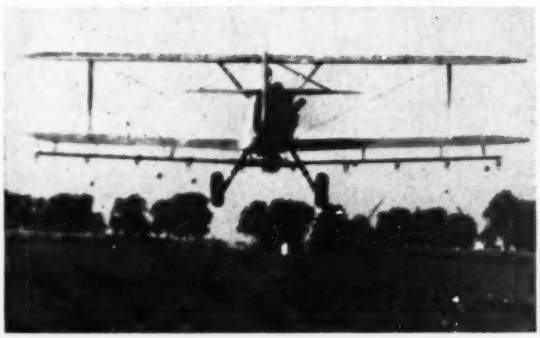


Turbine and generator (right) at AEC's Idaho reactor testing station, operate on steam heated by liquid metal coolant of reactor. Bechtel and P. G. & E., one of four industrial teams reporting to AEC, believe atomic power could be produced now in a plant rather small compared to modern central stations, at approximately twice the cost of conventional power. But atomic power plants, to justify their construction costs, must be very large. Paper presented by W. H. Nutting, of P. G. & E., and R. A. Bowman, of Bechtel Corporation.



AIR FILTRATION FOR DIESEL ENGINES

Radically new type of dust-catching adhesive for air filters used on diesel locomotives doubles filter service life and withstands extreme temperatures at full efficiency. Developed by California Research Corp. in cooperation with Southern Pacific and Farr Company. Paper by A. W. Hardy, B. F. Kline, F. J. Hanley, at California Research Corp.

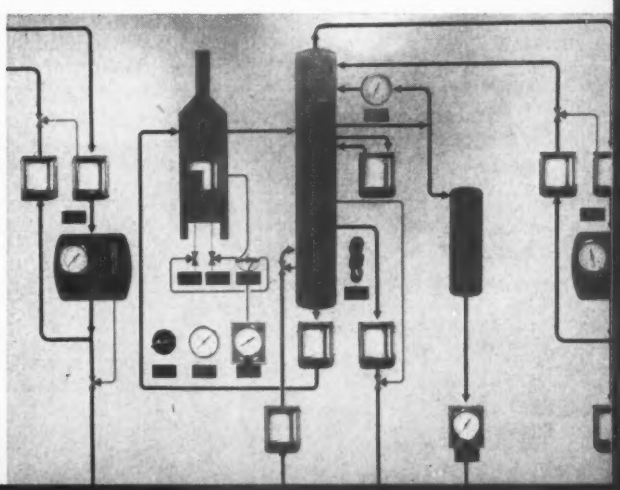


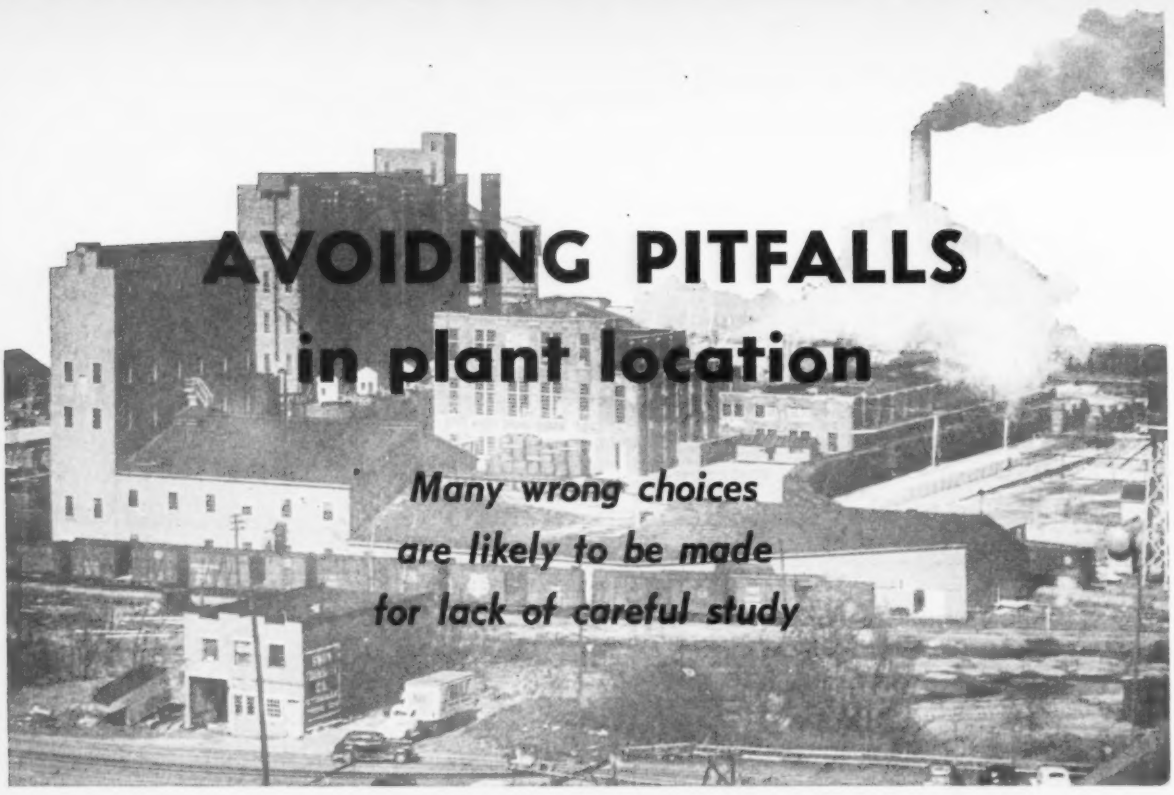
AIRCRAFT AIRFLOW PATTERNS

Research on wing tip and propeller air-flow patterns of agricultural aircraft revealed direction and velocity of air currents acting upon dust and spray particles released from a Navy N-3-N (rear view, above). Ten small cages, mounted on the spray boom, each contained small hydrogen filled balloon, adjusted for no gravitational effect. Pilot released balloons simultaneously, and their paths were recorded by two movie cameras. Paper by Wesley E. Yates, Department of Agricultural Engineering, University of California, Davis.

INDUSTRIAL CONTROL CENTERS

Effective use of modern instrumentation for precise quality control demands grouping the instruments into control centers, of which there are two types, graphic and non-graphic. Swanson graphic type (below) uses miniature instruments set in a flow diagram illustrating the primary components of the process. Non-graphic type uses larger instruments with such accessory equipment as push buttons for starting motors, etc., mounted in steel enclosures. Paper presented by Nels E. Swanson, Swanson Engineering and Manufacturing Co., Los Angeles, Calif.





AVOIDING PITFALLS in plant location

Many wrong choices are likely to be made for lack of careful study

SELECTION of a plant site in the West can be a major move toward satisfying a desire for industrial accomplishment and substantial profits.

The Far West offers many benefits to industry which cannot be duplicated elsewhere in the United States. But whether or not these opportunities can be used to further such objectives, will depend on how well industrial requirements are meshed with regional, community and property advantages.

To explain why this meshing often fails and what should be done about it, requires a review of the policies and procedures usually followed in site selection.

If the time has come when management thinks that a move to the West is desirable, the many alluring articles or advertisements published by chambers of commerce, trade associations, railroads or real estate brokers, quicken the interest of management to a point where it often begins to correspond with one or more of these "booster" groups.

Or the more conservative, not desiring to reveal their purpose or identity, may send a discreet letter of inquiry to a corresponding banker or attorney, with the request that it be placed in the proper hands. But sooner or later, if this masked approach is made, the inquiry will reach one of these groups.

To understand what can happen if this occurs, requires an explanation of the policies and procedures governing organizations of this nature.

A chamber of commerce or trade association is supported by members who are engaged in business in the area in which it operates. This area may be a town, city, county or other geographical unit. Membership usually includes a number of individuals, companies and corporations and two or more of them may be engaged in the same occupation or activity. The organization is non-profit and its expenses are paid by member dues or public contributions.

Such a set-up makes it necessary for the organization to confine its activities to the general advancement of the entire area in which it operates. It cannot favor one member over another. The information it gives to and the services it performs for its members and the public must be of a general nature. And all of its procedures and practices must conform to such policies if it expects to avoid the destructive force of individual jealousies.

Accordingly, when an inquiry reaches such a group, management will usually receive a prompt and courteous reply, accompanied by reports, graphs, maps, pictures and other means of extolling the area, all ably compiled. There will usually be statements concerning climate, weather, transportation, freight rates, public utilities, labor conditions, local government, taxes, fire and police protection, schools, churches, shopping facilities and recreational areas. But it would be unwise for the management receiving such general information to apply it immediately and conclusively to its requirements.

By
C. W. PETERSEN
Chief Engineer
Industrial Engineering and Development Company

Buying sight unseen

What would you think of a purchasing agent who bought a special gear solely on the strength of a catalog published by a gear manufacturer, which gave him a glowing account of the plant and personnel but only pictures of the many gears produced, without also providing specifications?

We should remember that the West offers to industry a variety of topography, climate, local government, utilities, transportation, working conditions and living environments.

For example, we have topography ranging from high mountains to deserts below sea level, and climate ranging from extreme cold to extreme heat. Such differences minimize the effectiveness of general information when it is used to determine the meshing possibilities between advantages and requirements.

A California company built a plant in a desert region to manufacture a very standard article—soil pipe. All general information was against choosing such a location. But the special advantages were so compelling that the company can transport its raw material and scrap steel about 400 miles and its finished product from 100 to 400 miles and still make a good profit and enjoy unusually good working conditions.

Thorough search

Confining the consideration of a plant location to general information can be surprisingly costly.

Recently an industrial engineering firm was called upon to continue the work of industrial site selection where a company had stopped. They found that a selection, based on general information, had so involved financially the company, that it will not be free of costly obligations relating to a wrong site, until after ten years have elapsed and thousands of dollars have been wasted.

Even if management realizes that site selection should not depend on generalities, it is not uncommon for it to request a booster group to obtain detailed help from representatives of property interests, or to appeal directly to such representatives for such detailed information. But this course can be erroneous also.

Representatives of property interests are usually such people as railroad officials and real estate brokers. And to understand what can happen to management if its inquiry reaches such representatives, requires an examination of the policies and procedures that invariably govern them.

A railroad official's desire is to increase the freight tonnage and frequently to sell or lease property of the railroad he serves. A real estate broker's desire is to sell or lease property he has listed.

Each represents special interests and neither is likely to receive any benefit for the efforts he expends unless a "deal" is completed involving the property or activity he represents. Consequently these representatives will do and they should be expected to do all they can to induce management to accept exactly what they have to offer. Such properties may be valuable properties reasonably priced. But they may not meet management's requirements.

Not long ago, this subject of industrial plant selection was being discussed with the industrial property specialist of a large and reputable Western real estate company. Finally he pointed to a bulging file on the corner of his desk and said: "We promised to make a selection of a plant site for one of our customers. For two months I have worked on it from time to time, adding information whenever I could —and then moving the file to the opposite corner of my desk. I wish I could forget it, because during the time I have spent on it, I could have made a dozen sales!"

Again resorting to the purchasing field, what would you think of a purchasing agent who was induced to buy an excellent worm gear for use in a machine which required a spur gear?

Even if management tries to solve the site selection problem with the combined aid of a booster group, railroad representative and real estate broker, serious and costly errors can be made, if the requirements of management are not first clearly established and then accurately matched with available sites.

A few years ago, a nationally known manufacturer determined to establish a factory on the Pacific Coast without first clearly determining its needs. Made enthusiastic by a booster group in Southern California, welcomed by a railroad official who had a blind spur that was producing no freight revenue and urged by a real estate broker whose principal desired to sell "a remote and irregular corner" of his orange grove, this company finally yielded to the combined persuasions and bought a site in Orange County—an excellent parcel of orchard or vegetable land.

Sometime later as production costs became disproportionate to sales income, industrial engineers were asked to determine and correct the causes. Among other things, they isolated the following costly causes with respect to plant location:

1. Due to railroad equipment limitations, raw material had to be transported by rail in open gondolas a distance of about 750 miles. In summer, the material became so dry that appreciable weight was blown away in transit. In winter, the material became rain-soaked and costly to handle. At that time this difficulty could be solved only by using hopper cars or sharply reducing the length of haul. Neither was possible.

2. As volume increased, the single blind spur track was not sufficient to handle the increasing number of incoming and outgoing cars. Unloading and loading delays seriously interfered with necessary production schedules. And no price would induce the owner of the adjacent orchard land to sell

New Western plants highly diversified

ONLY SIX strictly military out of total of 500 new or expanding spur track industries located on Southern Pacific lines from Portland to El Paso in 1952. Heavy population increase is the answer. Southern Pacific reports new industry prospects for 1953 as promising as 1952. Here is the 1952 score:

Agricultural, 95 industries. These include plants handling perishables other than meats, such as fruits, vegetables, melons, tomatoes and other foodstuffs; alfalfa meal; grains; cotton and cottonseed.

Livestock, meat and poultry, eight industries.

Beer, wine and liquors, four industries.

Lumber, logs and wood products, 103 industries. These include sawmills, remanufacturing and moulding plants, plywood and veneers; furniture; poles and piling; paper and its products, such as newsprint, bags and cartons.

Construction materials, 64 industries. In this group are plants handling electrical equipment; plumbing; aggregates; silica sand; cement and products; metal and asbestos pipes; paints; plasterboard; roofing material and coatings; also general construction.

Steel and metal products, 46 industries. Includes heavy machinery, agricultural implements, electrical appliances, automobiles and parts and scrap metals.

Mining and processing, 17 industries. These include, besides those handling various ores, agricultural lime and phosphates.

Oils and chemicals, 28 industries, including petroleum products and miscellaneous chemicals, fertilizers and insecticides.

Rubber products, three industries.

General merchandise handlers, seven industries.

Freight forwarders, six concerns.

Military equipment and supplies, six concerns.

Balance of industries located are miscellaneous manufacturers and distributors handling casters, lamps, canned goods, knitted goods, ink, rivets, seeds, radio and television and other wood, metal, food and related products.

Have you thought of these location factors?

(From "Plant Location," by Leonard C. Yaseen, Fantus Factory Locating Service, New York)

"Center of Market"—not purely geographic, but a weighted point determined by density of customers.

Freight Advantage—A few miles may mean a different freight rate.

Labor Market—Most desirable market is where industry, commerce and services are in balance. A commuting population is white-collar, won't accept industrial employment.

Municipal services—Are you in danger of sewage disposal system assessments?

"Climate"—Includes permanent type of population vs. transients, insurance rates, crime situation, abnormal theft losses, attacks against property, etc.

Transportation — Are merchandise trains, direct single-line motor truck service and freight forwarder service available?

Accessibility — Can the labor pool reach your plant conveniently? Is public transit handy? Is the plant oriented to the highway network?

enough additional space to provide required trackage and switches.

3. Damage to plant buildings and equipment had been appreciable the previous winter due to some "unusual" rainfall. It was found that such rainfall was not uncommon and that if it was repeated or materially increased, more damage could be expected. It clearly appeared that this threat could not be controlled without the expenditure of large sums of public money for run-off control and appreciable sums by management for plant protection. Management could not provide the means to solve the problem.

The following winter, heavy rains came in the mountains to the north and flood waters rushed through the plant, destroying large quantities of finished product and seriously damaging plant and machinery.

As there were no advantages gained by management from the selection of this site with respect to other matters, it clearly appeared that it was a wrong and costly choice of plant location. In retrospect, it could be asked how management could possibly have been so mistaken.

But when it is realized that industrial plant site selection involves at least 52 subjects of inquiry and the answering of at least 131 questions, if the one best site is to be found, it should appear that for the sake of accuracy and overall money savings in plant operation, this important work should be placed in the right hands and be subjected to reliable methods of control. And this is true irrespective of the simplicity or complexity of the case.

Get to the bottom

These methods should be predicated on the experience of management and the findings of competent industrial engineers. While preliminary matters can be handled by mail, the final inquiry concerning management's requirements should take place at management's plant with the aid of industrial engineers who are familiar with the Western region to be explored. These same engineers should then be authorized to match the requirements agreed upon with the advantages offered by the various areas in the Pacific Coast Region.

But it might be argued at this point that if the requirements have been determined, why would not the results be just as effective if booster groups or representatives of special interests be requested to match such requirements? But let us pause a moment.

Practical experience needed

Most employees of the various booster organizations, the heads of the freight and land departments of the railroads and real estate brokers specializing in industrial properties, are men of ability and integrity. But they are not industrial engineers and it is unfair to ask them to try and do an engineering job if it is beyond their skill and when the work is in conflict with the scope of their employment.

Should you employ a good house contractor to build a gothic cathedral?

It should be apparent then that senior engineers engaged in the consulting field should be required for this work—men who are familiar with the Pacific Coast as well as the various professions involved, such as civil engineering, geology, architecture, construction, real estate selection, appraisal and conveyancing, banking and law, and who can smoothly direct all of the activities of the associates who practice such professions.

Perhaps at this point it would be well to give an example of what can be accomplished if such a course is followed, and in a general way, how it is done.

A chemical engineer on the East Coast had completed experiments with raw material from California. Laboratory samples of a new building material had been made, the characteristics, appearance, dimensions and usefulness of the material had been determined, the means and methods of manufacture had been studied and the design, capacity and cost of production machinery had been ascertained.

In addition to this, a company to manufacture and market the product had been formed, negotiations for the purchase of a San Francisco Bay Area plant site were advancing rapidly and management had decided to conduct all production operations at this site.

Upon being informed of this progress, industrial engineers were requested to make a complete deduction and report of the profit potential of the proposed venture, assuming that the site selected was purchased and used for that purpose.

If there had been a good production and sales record for this material, the job would have been comparatively simple. But as there was no such record, it became necessary first to study the important subject of market potential. For there is little use in determining quantity and cost of production, if you do not consider sales volume and price.

When this phase of the work was completed the results were so promising that the company officials, being prodded by the land owner's representative, wanted to close the deal for the purchase of the selected site. But they were prevailed upon to wait until the completion of the report.

Based on the potential sales volume and income, the dimensions of the selected site and the capacity, relationship and proposed lay-out of the production machinery were checked to determine (a) if the proposed site and machine capacity were sufficient for present needs and (b) if the site could accommodate future plant expansion.

Study all details

As the preliminary answers to both questions were negative, the work continued through the following subjects:

1. Materials or components, including:
   a. Source—Quantity and Quality;
   b. Availability—Means and methods of Procurement; and
   c. Cost;
2. Transportation from source to selected plant site;
3. Plot, Plant and Machine Lay-outs, including Handling and Stocking of Raw Material;
4. Production of Marketable Volume and Plans for Plant Expansion;
5. Stocking of Finished Product;
6. Handling and Transportation of Finished Product;
7. Capital Requirements; and
8. Costs of Operation and Administration and Profit Estimate.

Study of these matters finally produced with respect to the plant site selected, the following disturbing answers:

1. An open spur track having at least 175

Continued on page 56

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Revere offers you more than metal. You can benefit from our four-way collaboration, and we suggest you look into these extra services.

1. Revere salesmen often save customers money. They may recommend a less expensive alloy if it will serve as well as a more expensive one. Or they may suggest an extruded shape, costing more than plain bar, but saving important sums by reducing costly machining operations. They are capable of giving sound advice, because they are well trained and experienced, and take a sincere and informed interest in the welfare of buyers.

2. The Revere Technical Advisory Service was established by Revere over 20 years ago, as a nation-wide organization whose duty it is to collaborate with engineers, designers and production men, seeking ways to solve problems, cut costs, improve products, or all three.

3. The Revere Research Department operates a laboratory, staffed by engineers and scientists, and equipped with the latest scientific apparatus, including the spectrograph and X-ray diffraction. This Department is called upon by salesmen and Technical Advisors when they find it necessary to obtain thorough physical and chemical analyses, and base their recommendations upon such findings.

4. The Revere Mills, located in industrial centers from coast to coast, are an integral part of our organization, collaborating closely with the other three services. They give you exactly what you require, as to alloy, size, gauge, temper, finish, and their experience is often invaluable in helping to solve tough problems.

Please note that this four-way service, originated by Revere, does not take the place of your own engineers, designers or production men. It collaborates with them, confidentially. There is no charge or obligation. To obtain this service, get in touch with the nearest Revere Sales Office.

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y. Sales Offices in Principal Cities, Distributors Everywhere.

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COPPER ★ BRASS ★ ALUMINUM

AVOIDING PITFALLS in plant location

. . . Continued from page 54

clear track feet would be required for present use and 350 clear track feet should be available on the same spur to handle future plant expansion. This could not be provided.

2. An additional closed spur that would provide 250 clear track feet would be required to handle future storage expansion. This could not be provided.
3. No land was available for plant expansion.
4. Incoming freight tonnage and costs would be excessive.
5. The land price was too high to justify the use of any portion of it for raw material storage.
6. Land, building, machinery and equipment costs would be excessive.
7. Estimated profits were not attractive.

Although answers 1, 2 and 3 primarily involved plant site selection, 4 and 5 primarily involved production planning, and 6 primarily involved capital investment, they were all concerned with the most important subject of profits. Furthermore, these answers clearly showed that the interrelationship of all questions included in the overall problem was such that the danger of site selection to the exclusion of other considerations was sharply brought into focus.

Cooperation enlisted

At this point is was apparent that a new site for the proposed plant should be chosen. Luckily, the choice could be an enlightened choice, based in the first instance on (a) source, availability and cost of raw materials, (b) transportation of raw materials and (c) market potential of the finished product, including location, kind and size of the market, both present and future, and transportation to points of distribution.

With respect to these questions, a general plant location area was chosen, which assured favorable answers. Consequently it was ascertained, *with the aid of chambers of commerce*, what counties and cities in this area were most favorable with respect to the following questions:

1. Strategic Target Areas and Dispersion;
2. Local Government, including Land Use, Taxes, Police and Fire Protection, Education and Recreation;
3. Climate, Weather, Water Supply, both as to quantity and quality; Electric Power, Fuel, Sanitation, Communications and Local Transportation;
4. Topography, Soil and Area;
5. Labor Supply, Labor Relations and Labor Unions; and
6. Availability of Executive and Clerical Help.

When the answers to these questions pointed favorably the way to a particular area, *the engineers found with the aid of a real estate broker,* four available sites within this area. These sites were each studied with respect to the following subjects:

1. Elevation, Drainage and Earth Foundation;
2. Area, Dimensions and Plot Lay-out; and
3. Land Cost.

While these studies were proceeding, the desirability of revising the methods of manufacture in order to partially process the raw material at its source was explored, for the purpose of reducing the capital expenditures for land, buildings and machinery and reducing the delivery time, material tonnage and freight costs for transportation of raw material.

This study developed the fact that the raw material could be partially processed at its source under a favorable contract with either one of two reputable companies. Consequently, a contract contingent for performance upon the construction and operation of the plant, was obtained in favor of the client.

At this point the engineers were in a favorable position to complete the assignment by finishing the following work:

1. Plot Lay-out;
2. Plant Lay-out;
3. Plant Buildings—Design, Construction and Cost;
4. Machine Design, Capacity, Lay-out, Installation and Cost;
5. Equipment Selection and Cost;
6. Production and Production Cost;
7. Administration and Overhead Costs;
8. Relationship of Total Costs to Gross Sales;
9. Capital Requirements; and
10. Estimated Profits.

When this work was completed, it became possible to compare percentagewise, the differences developed between the property originally selected by the client and the property finally recommended. Shortly after the time when these differences were established, the engineers obtained for their client, an option to lease and purchase *the one best site* for the proposed plant, which was presented with the engineering report. And a short time later, the client exercised its option.

Results summarized

The advantages in favor of the site finally selected as a result of the engineering work performed, appear from the following:

Subject	*Increased*	*Decreased*
1. Plant Area	—	60%
2. Plot Area for Plant Expansion	71%	—
3. Land and Building Costs	—	31%
4. Machinery and Equipment Costs	—	36%
5. Incoming Freight Tonnage	—	60%
6. Incoming Freight Costs	—	40%
7. Total Costs before Income Taxes	—	16%
8. Profits before Income Taxes	15%	—
9. Quantity and Quality of Finished Product	No Change	

By sifting, eliminating, analyzing and fitting, the best combination of advantages was isolated and then meshed with the requirements of management—a procedure which would be like that followed by a good purchasing agent who obtains from the engineering department the drawings and specifications of a desired gear and then selects a reputable gear manufacturer who has the ability, experience and facilities to manufacture the gear required.

The industrial engineers chosen to do this exacting work, should, at the proper time, use the services of the various chambers of commerce, trade associations, railroad officials and real estate brokers. Under proper control, the services of such groups and individuals can be used to the utmost advantage and greatest satisfaction to all parties concerned.

By following such procedures, the regional, community and property advantages of the Pacific Coast can be meshed with the requirements of industry and management can go a long way toward realizing desirable industrial accomplishments and substantial profits and eliminating one of the basic causes of serious financial losses.

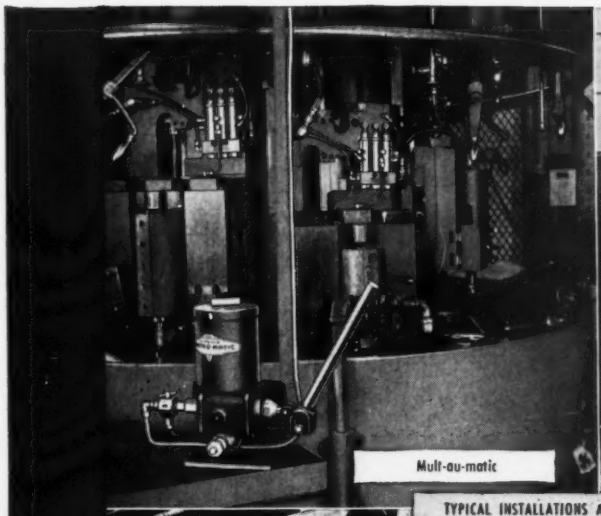
SANITATION IN INDUSTRY—

Creates sizable manufacturing operations for supporting it

TO THE OLDTIMERS, "Cleanliness is next to Godliness." To present-day industrialists, cleanliness is tied very closely to production and employee morale. Graphic evidence of this is the fact that one of the largest university research departments reports that building maintenance (industrial good housekeeping) ranks fifth in the nation in annual dollar volume, as an industry.

In the West, the prime trend in production methods is toward eliminating labor by replacing it with mechanization, where suitable engineering development indicates that such installation is advantageous.

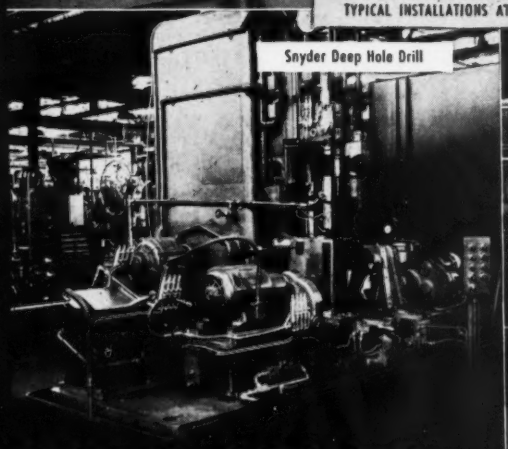
Where patented items are manufactured, the tendency is to be certain that the quality of raw materials is up to standard. New sources of raw materials are constantly being explored, in order to provide (1) a better quality, and (2) a lower cost.



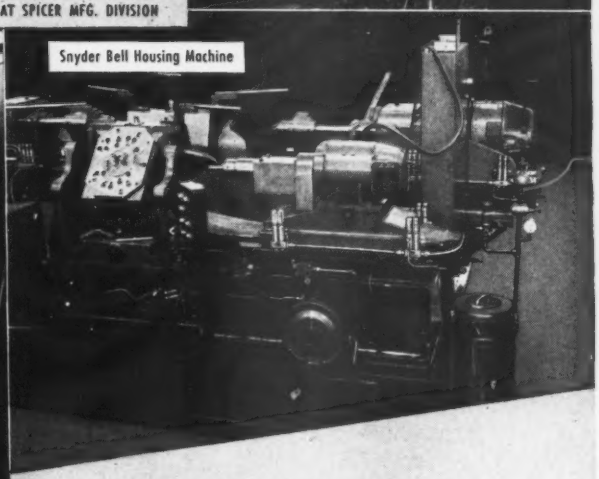
Mult-au-matic

Flex-Tooth Chip Crusher

TYPICAL INSTALLATIONS AT SPICER MFG. DIVISION



Snyder Deep Hole Drill



Snyder Bell Housing Machine

"Replacing Hand Lubrication with LINCOLN Centralized Lubrication Systems Saves Us Approximately $100,000 Annually"

R. C. Lohbauer
Production Engineering Staff
Spicer Mfg., Division of Dana Corp.
Toledo, Ohio

'There is more to lubrication than Webster's definition, 'to make slippery'. We define lubrication as 'applying lubricants to bearings in such a manner as to maintain a constant film of oil between moving surfaces'.

"Four years ago, a study of our lubrication practices and costs led us to a program of *standardizing* our lubrication methods by installing Lincoln Centralized Lubrication Systems on 86 vital machines. Here are some of the amazing figures in cost reduction resulting from our program:

Bullard Mult-au-matic Lathes

Maintenance cost reduced 60% or $72,000 annually
Production increased 20%
Produces better quality of work
Reduction in amount of scrap
Direct labor saving of $25,000 annually.

Atmospheric Controlled Gas Carburize Furnace

Direct maintenance labor savings, $1,200 per year
Savings in bearing material, $600 per year
Eliminated one hour per day lubricating allowances, $580 per year
Output increased 13% due to decrease in down-time.

Chip Crusher

Direct labor saving of $1,280 annually
Saving in replacement parts, $500 annually
Elimination of full time maintenance man, $4,667.52 annually.

"These are typical of savings effected throughout the plant. Lubrication boils down to maintaining a constant film of oil between moving surfaces by applying the *right lubricant* at the *right time* and in the *right quantity*, by the proper method."

R. C. Lohbauer, Production Engineering Staff
Spicer Mfg., Division of Dana Corp.
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DESIGNING ROOM
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Aircraft rat race. By the time it's over, the designer has dreamed up a tougher one to build

AIRCRAFT—

Quest for unmeltable metals is the biggest problem; fabricating trend toward single unit construction

EACH of the major aircraft-producing firms in the West is taking significant steps toward improving production methods, according to a survey by *Western Industry* made with the cooperation of these companies.

Review of their programs reveals that future activity is being developed around fundamentals of the "new design" in aircraft, planes that are now flying twice as high and twice as fast as their ancestors of World War II.

Metallurgists are hard put to keep pace with forward-thinking aircraft designers; metals suppliers are trying hard to provide materials to withstand the increased temperatures and shock that torment these new rocket-speed craft; tool and die makers are exerting a valiant effort to keep abreast of new techniques demanded by hitherto unknown substances in aircraft manufacture; and the aircraft manufacturers themselves are all wound up in the whole gamut of this overall new-development situation.

From a careful review of programs projected by major manufacturers, it may be concluded that the following primary trends are becoming evident:

1. Machines to process the components of *today's* aircraft are getting bigger and bigger all the time.

2. Even the latest products of metallurgical research are not quite fulfilling optimum requirements of altitude, speed and heat attendant to *tomorrow's* planes. The search for materials is of first importance; processing those materials is second.

3. With the advent of higher speeds for fighter airplanes and increased loads for bombers and transports, the trend has been away from multi-piece to single unit construction for basic load-carrying members. Principal development in current use is the wide profile extrusions for wing skins. Another project still in the development process is casting of wing sections of magnesium.

The desire to forge entire wing and fuselage panels in one unit requires investigation of new die alloys, control of processing temperatures and methods of reducing costs. Since all these components are required in very high strength aluminum alloys, the working of which by present methods might induce residual stresses leading to early fatigue, the problems are serious.

4. In the structural field, continuing close attention is being paid to large integral unit-type construction because of obvious advantages it offers in structural integrity, assembly, producibility, maintenance and eventual low cost.

So far, circumstances have dictated

that "sculpture" approach to this concept receive greatest exploitation since machining to final form from the solid provides greater adaptability to the varying requirements of airframe production and also because production means for this fabrication method were more readily at hand.

A brief summary of outstanding developments follows. It is divided into two sections: (1) firms who are major aircraft manufacturers, and (2) firms who are major aircraft component manufacturers.

In the major aircraft manufacturing plants there is an exceedingly intense and highly diversified research and development program always in effect. Only the most important are here reported—important, from the standpoint of an overall review of the aircraft industry.

In the major aircraft component manufacturing plants, there is also a continuing program of research and development, but *Western Industry's* report of this program is directed more toward smaller manufacturers, subcontractors and shop-size enterprises.

While thinking, in both cases, is toward future improvement, the applications are somewhat different. Hence, smaller firms, such as Ryan, Solar, AiResearch, are reported in as great length as the giants, Boeing, Douglas, Convair, Lockheed, North American and Northrop.

Higher forming pressures

Boeing. One of Boeing's most important developments is the use of higher pressures for rubber forming. Pressures as high as 3,500 psi. are now being used, as compared with the previous 880 psi. Other developments include use of optics for setting tools, improvements in metal bonding techniques, developments in heated tools and equipment for forming magnesium, titanium and 75ST, and improvements in air feed drills for heavy drilling.

Sandwich type construction

Convair. Currently, Convair is actively engaged in development and applied research on more than 12 major projects. These include use of sandwich-type construction in airframe fabrication; various types of adhesives; development of sonic cleaning, machinability and formability of titanium alloys; development of impact extruding and production applications of extruded integrally stiffened skins.

This development work is considered by Convair to be of utmost importance in order to improve not only the products, but manufacturing methods and costs. Funds for the programs are provided almost entirely by Convair.

The company has recently been awarded an important development contract by Air Materiel Command to determine the allowable amount of zinc contamination within die materials. This project is expected to require about 18 months before completion.

Midget hydropress

Douglas. One of the primary developments from Douglas Aircraft Co. last year was the Wheelon press, chronicled in *Western Industry* for May, 1952 (p. 56).

This is a brand new type of hydropress one-tenth the size of conventional presses, yet capable of exerting up to three times the pressures currently used to form thousands of sheet metal parts used in airplane construction. It was developed by O. A. Wheelon, production design engineer for the Douglas Santa Monica division, and is designed to do the type of shallow forming currently done on the Guerin-type rubber pad presses. Because of its low cost and small size, it can be used by small subcontractors.

Other developments include hot forming on brakes of titanium, roll burring simultaneous with progressive roll forming, monorail heat treat quench to prevent deformation, and hot oil curing dies.

Titanium application

Lockheed. Somewhat limited production uses for commercially pure titanium sheet were found in several heat shielding applications which do not call for too severe forming. Plans are now under way for a forged titanium alloy jet engine mount for a number of stretched formed, punch press and hydroformed parts, both in commercially pure and alloy sheet material.

Adoption of use of metal-coated glass cloth for vertical fin as well as canopy antennae has resulted in elimination of installation labor and 15% better reception. Glass cloth laminates are undergoing further exploration at Lockheed in many other applications.

Use of industrial adhesives has been extended to include the metal-to-metal attachment of a fairing on the F94 and honeycomb construction to include aluminum floor panels for the Constellation passenger version along with its existing applications on other projects.

During the last year, research developed a light-weight flexible coupling of superior qualifications for pressure fluid systems. In addition to weight savings of 80%, the coupling installs locally, allowing for smaller structural apertures and requires little more than hand-tightening compared with practically prohibitively large tightening torques on large AN connections.

Still further, it provides for substantial amounts of tube length and misalignment variations and inflight flexure up to four degrees, while requiring only standard "O" rings and tube beads. It is also capable of maintaining its fuel and gas-tight seal in a temperature range of —65 deg. F. to a high approaching 600 deg. F., depending on the "O" rings used.

Lockheed had much to do with pioneering and developing impact extrusion of high strength aluminum alloys, another primary development in the aircraft producing industry. This process was developed by them to a point where it is now used in mass production of high-strength aircraft parts.

No comprehensive review of the Western aircraft industry would be complete without recognition of the Hall of Giants, Lockheed's collection of elephant machine tools, huge presses and mills that enable the firm to build lighter, yet stronger structures to meet design requirements of the most forward-thinking aircraft architects today.

Sculpturing wing skins

North American. New and improved production methods and processes developed by North American Aviation, Inc. include form die quenching for both large and small parts, sculpturing of integrally stiffened wing skins with newly developed skin mills, use of mechanized equipment for shrink-

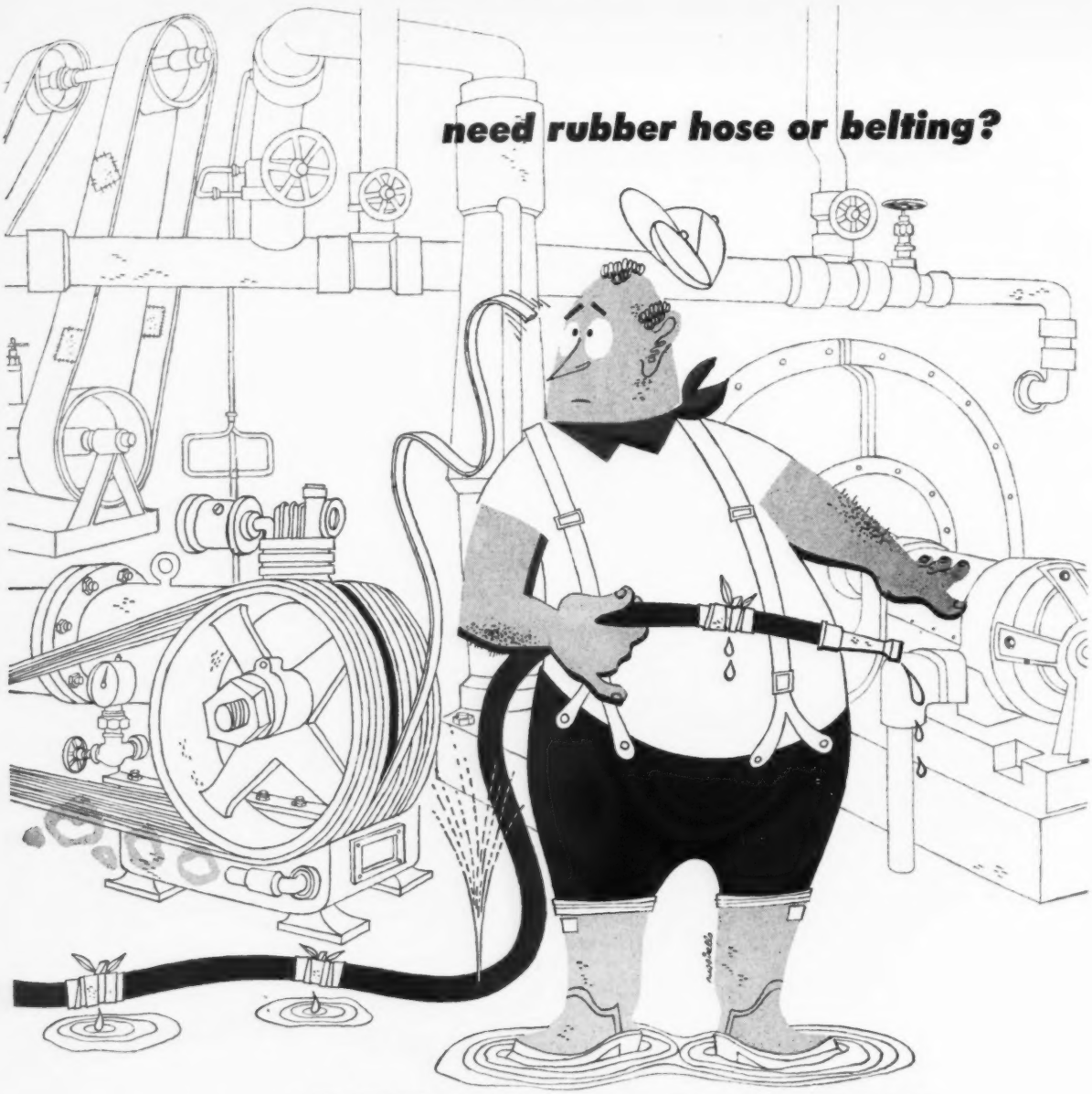
Continued on page 61

$7½ billion backlog

MAJOR West Coast airframe companies have now a total backlog of nearly $7,500,000,000. With that, they look forward to continuing business at the present high level through 1955.

These plants use nearly 40,000,000 sq. ft. of manufacturing area, employ more than 300,000 persons, have a weekly payroll of around $25,000,000, and produce more than half of the nation's aircraft.

There are more than 400 commercial transports of 36 passenger capacity and larger, now on order by domestic and world air carriers. All will be built in Southern California.



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AIRCRAFT—

. . . Continued from page 59

ing hydro-formed aircraft details, and new uses for metal honeycomb sandwich structure to obtain high strength and light weight.

Form die quenching of aluminum is a method combining heat-treating, forming and quenching operations into one continuous process. The method eliminates warpage and distortion that normally occurs during conventional water-quenching operations. Parts can be die-formed to close dimensional tolerances so no subsequent straightening operations are required.

A new North American designed vacuum chuck sine plate for an A-72 Onsrud milling machine to be used in making of tapered sections and wing and grid panels for current and advanced models of jet fighters.

The new Onsrud, recently acquired, has a 30 by 6 ft. bed, speeds up production of both wing grids and sculptored wing skins.

Glass-plastic materials

Northrop. By use of a unique template duplicator developed at Northrop Aircraft during the past year, that firm is increasing its production rate several times on sheet metal fabrication. Purpose of the template duplicator is to trim templates to within plus or minus .005 in. of the master template.

Thomas E. Piper, director of materials and process engineering, says a complete military combat-type airframe designed specifically for glass-plastic materials and manufacturing methods is considered entirely within the realm of possibility. He feels that one possible answer to surpassing the so-called "heat barrier" for high-speed flight is the manufacture of an "all glass" airplane of glass fiber construction.

Use of titanium is receiving great consideration by process engineers, because of its strength-weight ratio plus its ability to withstand corrosive attack at high temperatures. Northrop has been awarded an Air Force contract to redesign a type of F-89D rocket-firing tip rod that could be fabricated from titanium and titanium alloys.

During the past year, Northrop and the Air Force announced results of a closely guarded research project to produce cast magnesium aircraft wings. A section of an airplane wing 16 ft. long and adhering to exacting tolerances, believed to be the largest cast aircraft surface ever produced, was cast from magnesium through joint efforts of the firm's engineering and development team and the Aluminum Company of America.

Power packages

Rohr. Power packages their specialty, including those for Boeing's B-52 jet. Also building aft fuselage sections, wing tanks, exhaust systems, etc.

Welding achievements

Ryan. In the past year, Ryan has obtained several of the largest electrical resistance welders in the country, and has adapted these to production of huge aluminum alloy wing tanks for the Boeing B-47 Stratojet bomber.

More and more stainless steel components, such as jet engine exhaust cones, afterburners and combustion chambers are being fabricated by electric seam welding.

Ryan engineers have speeded up the action of spot welding machines beyond that which the manufacturers planned. For example, on typical afterburner sections, Ryan can now weld seams at the rate of 68 in. per min., three times the manufacturer's planned rate, by accelerating indexing equipment on the machines.

Net result of this development has been faster, more economical fabrication of stainless steel and aluminum alloy aircraft components, and more efficient, lighter weight structures for aircraft applications.

Ryan has been one of the pioneers in the field of ceramic coatings for high-temperature applications, counted among the most important developments in the past ten years.

Already ceramic coatings have demonstrated their ability to extend the life of exhaust systems by almost 50%, to permit substitutions of metals in high-temperature applications, previously unusable, and they hold out another promise in the field of titanium and other new alloys which have not yet been tried.

Ryan has further expanded its use of 19-9 DL stainless steel which was introduced in sheet form to the aviation industry by Ryan. Today, that firm takes all the sheet product developed, which product has demonstrated its superiority to almost every type of 18-8 stainless.

Internal machining

Solar. Progress in adapting high-production methods of the automobile industry to mass manufacture of jet engine parts was facilitated by installation of a specially designed machine tool that chops 87% off the time previously required to perform internal machining on the J47 engine aft frames. The 19-ton Ex-Cell-O machine was installed after two years of design work by Solar engineers, and is the first of its kind in the world.

The shell molding process for casting high alloy steels was introduced to the West Coast by the stainless alloy foundry at Solar's San Diego plant. Adaptation of this process to the casting of stainless alloy steels has been successfully accomplished, and it is now used in production of numerous parts for aircraft and industrial uses.

Specially designed equipment for welding ferrous metals has been perfected to weld mild and low alloy steels, dissimilar metals and stainless steel sections as thin as .05 in. at speeds up to ten times those formerly obtained with manual welding. Known as Sigma welding, this equipment utilizes an inert gas shielded arc but with a consumable electrode and is built around two welding heads purchased from Linde Air Products Co. A quick change of the electrode plus addition of flux makes the equipment adaptable for submerged arc welding.

As a result of specialization in sheet metal work, Solar has developed several specialized tools and processes, some of which are available commercially for use by other manufacturers.

The Sol-A-Die process, a unique method of modeling stage dies using flexible patterns made of cheese cloth and wax, was licensed to Rolls-Royce for their use in manufacture of aircraft engine parts.

Solar, a "prime mover" also in the field of ceramic coatings, is continuing research and development on this important phase of aircraft component manufacture.

This is the only company that has been given patent protection on a series of high-temperature ceramic coatings, known as the Solaramic Process.

During 1952 Solar, in the ceramic coating production phase of business, coated almost 12,000 units (jet engine liners, turbo hoods, and nozzle boxes), thereby establishing that firm as probably the largest Western production activity in this field.

Turbine output speeded

AiResearch. AiResearch Manufacturing Co., with its new $5,000,000 Phoenix plant now in operation, turned in the following production record last year:

Small turbine production increased by 220% over the previous year because of refinements and improvements in assembly line technique.

Development of special tooling by the company broke a bottleneck that had held up a national casting firm for two years in production of an exducer common to three types of gas turbines.

AIR POLLUTION—

Equipment trends are beginning to make themselves apparent in infant engineering science

MORE than four and a half years of smog-control work in Los Angeles County has indicated that trends can occur even in an infant engineering science like air pollution control.

The ferrous industry, for instance, has found electrical precipitators highly efficient for the collection of pollutants from large installations such as open-hearth furnaces. Baghouses, on the other hand, seem to maintain their popularity on medium and small ferrous installations as they have in the non-ferrous industries. Water-type systems have not proven as effective as the dry-type filter systems for these processes.

Electric furnaces are continuing to replace open hearths at steel mills and are more efficient from an air pollution control standpoint. Although capacities are more limited and the melt time per quantity is longer, reverberatory furnaces are displacing cupolas in the smaller gray-iron foundries.

Cyclones are effective in any dust problem as primary collectors to reduce the grain loading to bag collectors but baghouses, because of the higher efficiencies in the smaller-particle range, continue to find favor in the mineral processing, feed and grain industries to the loss of water systems.

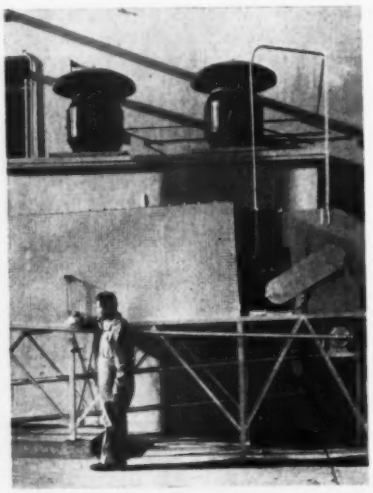
One trend presently gaining momentum is toward the use of incineration to burn fumes, odors and organic vapors from coffee-roasting, meat-rendering, fish-canning, varnish- and paint-cooking plants. Low-temperature dehydration has proven most effective in the drying of fish meal to the exclusion of the old high-heat systems.

Trends toward floating-roof tanks and vapor-recovery systems in oil refineries are continuing with about equal favor for each. Recent modifications in design have improved control performance. Vapor-recovery principles have been applied effectively to emergency blowdown stacks.

Plans are being carried out to install floating roofs on effluent-water separators at two refineries. Within the last three years smokeless-type flares, which use steam injection to produce a clear blue flame instead of the old smoking yellow plume, have been developed and are being adopted rapidly.

Sulfur recovery from hydrogen sulfide effluents has been successful to the extent that some refineries are erecting units at their plants instead of trucking or piping the absorbed material to outside processors. In some cases, where impurities in the effluent is high, ammonium sulfate units have been installed to make fertilizer from the valuable by-product.

San Francisco Bay area industries have been, for the past couple of years, engaged in voluntary measures directed toward abating the air pollution problem caused by their own operations. Millions of dollars have been spent by these firms. Actual measures taken and results produced will be summarized in a publication soon to be issued by the San Francisco Bay Area Council.



THIS FUME DISPOSAL system used in varnish cooking at the new Pittsburgh Plate Glass Company paint plant in Los Angeles is a sample of one type of control device.

From April 12, 1948 to June 30, 1952, 7,248 permits for air pollution control equipment were issued in Los Angeles County, and 482 denied. The approved permits to date represent more than $10,000,000 in control equipment. A detailed break-down follows:

1. Incinerators (all equipment used solely for the destruction of waste combustibles). Approved, 944; denied, 249.

2. Boilers (all equipment employing heat as a means for generating controlled vapors or heating liquids and which are not classified elsewhere). Approved, 676; denied, 13.

3. Heaters (all equipment used to heat petroleum crude or other liquids). Approved, 41; denied, 0.

4. Ovens and Dryers (all equipment used to remove water or solvent, or used to effect a chemical or physical change by means of heat). Approved, 491; denied 18.

5. Cookers (all equipment used to render, cook or digest organic materials or for hydrogenation, polymerization, etc.). Approved, 159; denied, 13.

6. Furnaces — Metallurgical (all equipment used to melt, heat or refine metals). Approved, 286; denied, 41.

7. Furnaces—Non-metallurgical (all equipment used to melt, refine, reduce, heat, etc. materials other than metals). Approved, 136; denied, 1.

8. Spray Booths and Coating Equipment (all equipment used to spray, dip, apply, etc. coatings to various materials). Approved, 656; denied, 2.

9. Sizing and Classifying Equipment (all equipment used to size or classify materials such as crushers, grinders, ball mills, etc.). Approved, 216; denied, 6.

10. Mixing, Batching, Blending (all equipment used in connection with production of concrete, asphalt, chemicals, fertilizers, etc.). Approved 98, denied, 10.

11. Blast Cleaning Equipment (all equipment used for tumbling, buffing, grinding, blasting, etc.). Approved, 157, denied, 5

12. Collection Equipment—Woodworking Industries (all equipment used to reduce or control emissions of air contaminations resulting from processing wood, such as blowpipe systems, cyclones, baghouses, etc.). Approved, 267; denied, 7.

13. Collection Equipment—All Other Industries (all equipment used to reduce or control emissions of air contaminants from operations or processes, except in woodworking industries, such as water scrubbers, baghouses, precipitators, filters, cyclones, etc.). Approved, 912; denied, 78.

14. Petroleum Refining Equipment (all equipment used by the petroleum industry for distillation, treating, cracking, recovery, etc. of petroleum or petroleum products). Approved, 160; denied, 1.

15. Plating and Anodizing Equipment (all equipment used for plating, anodizing, rinsing, etc., as applied by the plating industries). Approved, 203; denied, 0.

16. Metal Cleaning Equipment (all equipment used to clean or strip metals such as degreasers, detergent baths, pickling tanks, etc.). Approved, 117; denied, 0.

17. Holding Tanks and Bins—Solids (all equipment used to hold raw or intermediate solid materials in any given process to take up fluctuations in production). Approved, 242; denied, 9.

18. Holding Tanks and Bins — Liquids (all equipment used to hold raw or intermediate liquid materials in any given process to take up fluctuations in production). Approved, 754; denied, 3.

19. Local Exhaust Systems (all equipment used in gas handling which vent directly to the atmosphere without benefit of collection equipment, such as hoods, ducts, fans, etc.). Approved, 140; denied, 5.

20. Conveying Systems (all equipment used in handling and moving material, such as hydraulic, pneumatic and mechanical devices). Approved, 157; denied, 3.

21. Miscellaneous Equipment (all equipment not classified elsewhere). Approved, 414; denied, 16.

22. Governmental Installations (all classifications). Approved, 22; denied, 2.

Totals—Approved, 7,248; denied, 482.

ARO AIR TOOLS HELP GILLETTE GET SUPER-SPEED PRODUCTION

SCREW-DRIVING. Aro Screwdriver, Model 7329-R, in special fixture made by Gillette to hold the Super Speed Razor during assembly of handle. Foot treadle actuates throttle. Aro's torque control very important here—drives screw to just-right tightness!

GRINDING. Aro Grinder, Model 7014, used by Gillette in preparing blade stock for processing in a continuous strip, coiled on reels.

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By ROY C. HENNING,
Consulting Editor, Electricity and Electronics

ELECTRONICS—

UHF television will bring its own set of problems, 450 megacycles (citizen's band) has big possibilities for industrial use

COLOR TELEVISION appears to be perhaps five years off, according to authentic sources of information.

Acceptable systems are, of course, here but about the cheapest you, as a home owner, could put color in your home would be approximately $800. This is too expensive for the public, and I don't think the FCC will encourage any plunge into color for economic reasons and because the whole picture hasn't completely jelled.

The whole transition would be very much like the initial swing of radio manufacturers from radio to television. The lull in radio production right after World War II was a "natural" for television's entry at that time.

It is almost impossible to buy a new television set today without having thrust upon you the "added attraction" of "ready for UHF", "provision for UHF", "why not have UHF, too," and many other ways of saying the same thing.

This weapon against obsolescence which manufacturers are offering the public range all the way from an extra hole in the front panel (for the knob of your future UHF adaptor—when you decide to buy it) to additional space in the cabinet for your converter or easy changes in the circuitry to effect this change.

UHF (Ultra High Frequency) TV will be a boon to those communities which cannot or have not been granted a channel under the present setup. The present VHF (Very High Frequency) channels will continue to serve the large metropolitan areas in which they have become established in the past three years, and thus their usefulness is not diminished.

UHF difficulties

While UHF (Ultra High Frequency) is a medium by which television can be brought to millions more people who do not live in the large cities of America, it will also bring its own set of peculiar problems.

Television, when broadcast on UHF channels, will not have the ability to "reach into" the "dead spots" (brought about by tall buildings, hills, ridges, etc.) that any area will present nor will maximum range of transmission be as great as on the presently used channels.

At the outset of our present television, however, it was never anticipated that successful reception would be enjoyed over long distances that listeners now regularly boast about. Even curvature of the earth (which should, theoretically, just about put a practical limit on the effective distance a transmitting station could reach) hasn't had the predicted effect.

TV set owners regularly receive good pictures hundreds of miles from stations, and they also get good entertainment value from their set when hidden behind hills, mountains, etc., by catching some of the signals that ricocheted off the sides of surrounding obstructions. So, in spite of theory, the home owner turns on his receiver and looks as Milton Berle even though it is impossible.

Ultra High Frequency television is being given a big push by the efforts of two West Coast electronics firms. Eitel McCullough, Inc., has presented the radio world a five-kilowatt klystron designed especially for the new UHF TV frequencies. (A klystron is a type of vacuum tube most effective in generating radio frequency power in the UHF part of the spectrum.) Eastern transmitting equipment manufacturers (DuMont) have already designed equipment around this tube. Varian Associates, pioneers of klystrons, are also building a klystron for the new frequencies.

Previously radio, as a means of com-

munication, was thought of in terms of transoceanic or at least transcontinental radiograms or overseas broadcasts. Distance entered the picture somewhere along the line. It is true that with some early laid cables already bowing out, radio will soon be the sole means of communication between continents.

Cable passes into history

The year 1952 saw the expiration of a really historic institution, the Commercial Pacific Cable Company. CPC connected San Francisco with Honolulu, Manila, Shanghai, Hongkong, Tokyo, and other points in Asia.

Submarine telegraphy, as the art of communication by undersea cable is called, employs a very expensive medium. Many millions of dollars are invested in a cable to span an ocean like the Pacific so it was long realized that when this "piece of string," as it was fondly referred to by the cable operators, reached the end of its life span it would never be replaced.

The Commercial Pacific's cable was laid in the early 1900's. The survey of the ocean's floor prior to actual laying of the cable brought about discovery of the Great Nero Deep (a huge canyon on the bottom of the sea).

Pioneering the first occupation of Midway Island as a relay station point was another facet of their interesting history. It is a little known fact that the Battle of Midway was directed for the United States forces by officers located in Honolulu. Orders were spoken to the cable operator in Honolulu who sent them telegraphically to the Midway operator who, in turn, translated them into the spoken word for the benefit of Navy officers on the island. Cable communication has one attribute that radio cannot claim—it is secretive—no codes need be resorted to.

Equipment used by CPC was of such antiquity that it should really share a place in the Smithsonian Institute now. Most of their equipment was little changed since early-day British electricians and physicists invented them. Mere thought of employing radio valves to perform some of the functions of amplification filled them with revulsion.

Still-in-all, the cable stayed in the thick of the fray and successfully competed with four trans-Pacific radio communication companies and always made money too, something the radio companies couldn't always claim.

Finally, the reliable old cable has literally rotted itself away, and so has come to pass the fade-away of a grand old institution.

My seven-year affiliation with Commercial Pacific Cable Company has given me an affectionate feeling for this now lost art. Cables continue to work across the Atlantic, but it is very doubtful if any new cables will ever be laid; radio has written its finis.

SINGLE-SIDEBAND TRANSMISSION is one method of squeezing extra communications signals into the crowded radio spectrum below 30 megacycles. John F. Honey, senior research engineer at Stanford Research Institute, tests this transmitter. Miniatured television transmitters will accompany rockets for carrying information back to earth about the flights.

Radio, other than the familiar broadcasting medium, is becoming more and more an every-day part of the average American. Who now doesn't know what "microwave" radio is? Sid Caesar comes West via "microwave." The telephone company has taken great pains to see that the layman knows how San Francisco and Los Angeles exchange TV programs. A few choice mountain-top locations and the program is "jump-jumped" or relayed from one city to another.

This sort of radio is easily understood by everyone. At least the principles are grasped. Even Junior knows that if TV reception isn't so good (too much snow), Dad should put up a Yagi, or at least hoist the antenna up another ten feet higher.

Because the public has become this much radio-minded in such a short time it seems natural that it will soon adopt the citizen's band and still further revolutionize the daily activity of individuals.

A few radio companies have made available for sale units for transmitting and receiving in the 450 megacycle (citizen's) band. An application may be made for business or pleasure. The only requirement to obtain a license for operating such equipment is that applicant be a citizen of the United States. Since the licensee need not have any technical radio knowledge, it seems a reasonable requirement that equipment to be used be made by a company authorized to manufacture it.

Applications of this new radio band are practically limitless. Naturally, everyone thinks, right away, "what can it do for me, personally?" You could have a link from your home to plant or office. This would be especially useful for plant superintendents and production managers who are on call at any time of the night or day. Ability to talk from your car to plant or home while driving down the highway is a feature we have all had use for at one time or another. In business or in pleasure, it can do a necessary job for you.

Big industrial uses

Industrially, plant management should see big uses for this tool. Western industry hasn't been forced to confine itself for the sake of space; consequently, many plants cover huge acreage and consist of several disconnected buildings. Personnel enroute between buildings, plant superintendents, foremen, truck drivers, fork lift operators, can be contacted by a control dispatcher who transmits through a centrally located transmitter. The dis-

patcher, for small numbers of units involved, can be the PBX operator doubling in radio.

Mobile units and fixed-position units alike require no knowledge of radio and can be operated by truck drivers or office help as the case may be. Many operations, in industries of all descriptions, can be expedited by radio control.

Police, fire, taxi, telephone and railroad uses of radio communication have not been touched upon because these services have already been allocated channels for their operation and their use of them is an accepted thing.

Utility companies have become large users of UHF radio. The operation of several natural gas pipelines is entirely controlled by this means. Our largest Western supplier of gas and electricity (Pacific Gas & Electric Co.) has made its pioneer installation of a UHF telephone link, and is planning a coastwise system in near future. They already employ a large fleet of mobile units in a wide variety of vehicles.

New impetus to miniaturization

Miniaturization of radio equipment, which came into its own with the advent of the proximity fuse of World War II, has now been given new impetus with heavy demands for electronic equipment that jet aircraft require. For example, the World War II popular fighter P-38 carried about 170 lb. of electronic equipment. Present-day F94C jet fighters carry approximately 1,200 lbs. of electronic equipment.

Increased speeds call for more fire control equipment. More and more duties must be relegated to electronic units since human perception cannot cope with problems brought on by supersonic speeds.

Miniaturized television transmitters will accompany rockets for conveying back to earth all the varied information collected on such flights. All dials, meters, gauges and other instruments on the rocket can be read by scientists remaining on earth (as yet).

In like manner, several power companies are remotely controlling power stations by reading a panel full of meters at a distant point via television. Industry has recently been presented with a baby brother of the iconoscope tube (used by most TV broadcasters in their cameras).

This tube, which measures only an inch in diameter by six inches long, can inexpensively be put to use in industry in a hundred different ways. The possibilities will start the wheels turning in many a head. Oil men can now see exactly how and where they are drilling when a miniaturized version of a television transmitter can be lowered down into the well.

These, and many other industrial applications for compact or tiny electronic units will keep the program of miniaturization at Stanford Research Institute going at a steady pace. Dr. Cledo Brunetti, Associate Director, and L. K. Lee, head of the Advanced Group of the Institute are keeping an interested eye on developments in this important field.

Printed electronic circuits tie in completely with any program to minaturize a radio circuit. Printed circuits are regularly used in many television receivers today, but they still represent only a small part of the total circuitry of the set.

Pioneering work is still to be done in the application of Printed Electronic Circuits (PEC) to present-day radio, especially with an eye toward establishing production methods. Ultimate goal of such a program would be to manufacture a radio or television receiver without tedious and delicate hand-wiring methods. Such departure in manufacturing technique could make complex radio equipment come off the production line at the speed of putty knives in a putty knife factory. Stanford Research Institute, among others, is working on such production methods now.

Transistor problems

Transistors still present their own peculiar problems and are not "just around the corner." It would seem, according to people who know their present weaknesses, that transistors may still be two years away from popular usage. Their application to any electronic circuit certainly would help in its miniaturization.

Transistors are being made by hundreds of thousands right today, but the reason the public is still buying and replacing "old-fashioned radio tubes" is because almost the entire output of transistors is being consumed by development laboratories and plants across the country.

Electronic "brains" and computors received quite a boost in the public eye when most everyone saw Univac in operation on presidential election night. Up until that time most of us had heard about feats of the electronic computor at Harvard, and of a few others built since that time. These devices have not relegated brilliant mathematicians like Einstein to the discard. On the contrary, they are tools of these super-men that can lop off time in terms of days or years otherwise required to solve some of their problems.

On the more earthy side of electronic computing machines, we can already see their entry into offices, banks, etc. One machine doesn't do everything just because a button is pushed. Machines must usually be "fed" by a staff of key-punch operators who collect information from "acres" of file cabinets.

"Memory storage"

This little inconvenience has logically led to adoption of "memory storage" devices. Information storage or memory devices can take the shape of electronic storage units or easy-to-understand magnetic recording tape.

When an "electronic brain" requires certain information and can select it at will, the whole system has become still further mechanized. It has been said one large insurance firm could run with half their present staff if such electronic equipment were employed. Unreliability, in just one of many hundreds of vacuum tubes in such a system, could certainly garble output and render it unusable.

In the field of research, Great Britain employs centralized research. We in America have competitive research, in the same manner we conduct our businesses. It would be interesting, if such comparison could be made, to study the relative merits of each system. Britain has maintained an enviable reputation with perhaps a smaller group than we maintain in this country.

Research, to a greater degree than any other field of endeavor, has become more and more specialized. This has brought about a new term in laboratory language. Teams are organized to attack specific problems. Attached to such teams are chemists, physicists, electronic engineers, metallurgists, biologists, etc. All can contribute to the project and all can glean new material for their particular interests.

Transistors owe their discovery to solid state physicists who unearthed certain phenomenon about the nature of semi-conductors that fitted into the jigsaw puzzle of the electronic researchers.

More manufacturing

The ratio of manufacturing to development and research in the West has moved again, during the past year, in favor of manufacturing. Research and development still predominate the scene in the West. All peninsula electronic manufacturing firms have expanded. Hughes Aircraft still employs some 2,000 to 3,000 men in research and development and they are soliciting for more in radio periodicals.

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RAILROADS—

Dieselization entails big program of rebuilding and re-equipping the locomotive terminals

LAST YEAR was a banner year for Western railroads: it is the first year since the end of World War II in which a decrease in annual operating expenses has been shown.

Paradoxically, this decline was influenced by a falling off in traffic volume, while at the same time it was accompanied by tax increases (principally federal) amounting to several times more than the reduction in operating expenses.

When available, final figures for Class I railroads last year will show improvement in revenues, both gross and net, over 1951. These improved revenues, despite car loadings and revenue ton miles below the previous year, clearly are a result of rate advances authorized during the year.

No slack for car builders

The backlog of new car orders at the turn of the year is big enough to keep the country's car building plants busy for at least nine months at their full production capacity of 10,000 cars a month. It will be increased as material supply indicates that the production can be maintained at that rate.

This situation is much the same as to new locomotives, over 1,000 diesel power units still being on order November first.

Continuing progress toward complete dieselization is indicated. About 65% of the locomotives in freight train service now are diesels, with 70% diesels in passenger train service, and 76% diesels in yard and switching service. By contrast, in 1946 less than 10% of the locomotives in freight service were diesels, as were less than 16% in passenger and less than 30% in yard and switching operations.

This rapid transition has required re-equipping and re-building of locomotive terminals, a program far from complete but well under way. Changing from steam to diesel power required abandonments and replacements, in many cases, involving large expenditures—some are still necessary.

It does not now appear likely that truck transport of mail will greatly affect railway operations generally. So far, mail diversions from rail to truck have represented relatively small volume loss to the railroads as a whole. Diversions have been mainly on short haul mail movement. Changes in operations resulting have been in local rather than in long distance train service.

Yards being modernized

Accelerated installation of improved signalling systems, and enlargement and modernization of terminal yards to facilitate train movements has been an outstanding factor in railroad efficiency programs in recent years, particularly last year, and they will be again this year.

It is now estimated that at the end of 1952, approximately 8,000 track miles have been equipped with Central Traffic Control in a five-year period. Extensive plans for further installations of this type will be a part of the 1953 program, along with construction of new and re-arrangement of old terminal yards to speed up operations and shorten overall transit time.

Last year, a complete day was lopped off the freight transit time (in both directions) between Pacific Coast ports and the Midwest. Relative reductions applied also to intermediate points such as Omaha, Denver, and Ogden. Coupled with substantial reductions made by Eastern lines, these Western schedule improvements result in shortening transit time of transcontinental freight movements, with corresponding improvements at intermediate points.

TRAILERS—

Van bodies are increasingly popular, and decided swing away from steel, to aluminum use

WITH BOLTS laid out in readiness, holes are drilled from under side of underframe at Union Pacific Denver car shops. Each board numbered, cut to size and pattern

A NUMBER of trends are identified in the trailer field. For one, there is a definite tendency toward use of basic raw materials manufactured on the West Coast. Steel in practically all forms is used as well as aluminum sheets and extrusions, all available now from Western suppliers.

There is a definite trend from so-called platform or stake and rack trailers to van trailers. Cargo must be protected from the elements; only closed vans can give that protection.

More and more refrigerated products are being hauled.

There has been a decided change from the use of steel in van bodies to lightweight metals, particularly aluminum. Reduction in tare weight made possible by substitution of aluminum for sheet steel increases payload and still permits the operator to remain within legal gross load limitations.

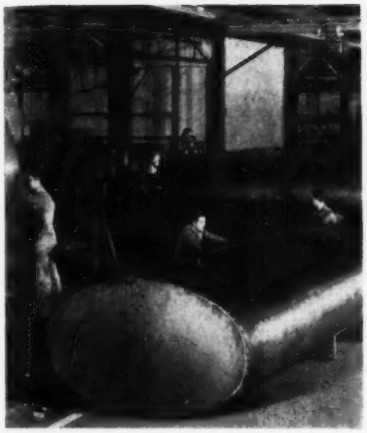
Another trend which has recently become very pronounced, is toward tandem axle design. More than half of the trailers now built are equipped with tandem axles. The advantage here is, of course, greater clearing capacity with less impact on the highway.

Some problems

In the production field, much attention is being paid to specialization in welding, and techniques are gradually being developed and improved.

The trucking industry is beset with a few problems, too. Here are some:

One of the greatest problems of those who operate heavy duty freight



HIGHWAY HAULS of petroleum products, chemicals and other liquids mean trailer and truck tanks must be free from leaks and damaging stresses. Scene in Fruehauf's West Coast body shop.

trailers is that of adequate braking ability. Long mountain grades, particularly with improved highways and road surfaces, demand the utmost in brakes.

Similarly, the heavy city traffic, especially during rush hours, makes it necessary that trucks and trailers have braking ability equal to or better than passenger cars. This subject is one that is currently receiving study of all commercial trailer manufacturers.

Another problem is the present effort to impose far heavier state license fees and/or use taxes—particularly the so-called ton-mile tax on the operators of commercial trucks and trailers. There is a particularly strong fight being waged right now in Oregon.

Another problem facing the industry is the wide range of size and weight restrictions, that vary from state to state.

Alaska is looming stronger and stronger as a good market for this industry's products. A number of West Coast manufacturers are building substantial numbers of trailers especially designed for service in Alaska. One company has built a number of demountable aluminum trailer bodies and special chassis designed to serve the Alaska market.

These bodies are loaded in the States, transported to dock-side on the trailer chassis, and then lifted to barges where the bodies are nested together, the chassis remaining ashore. At the Alaska end, the bodies are transferred to other chassis and delivered to destination.

If current prediction for good business for this year holds true, the truck-trailer production should continue at an average rate of about 5,000 per month, nationally.

WIRE PRODUCTS—

Better lubricants and coatings help to speed manufacturing — Dry descaling replaces pickling

PRODUCTION SPEEDS in the manufacture of wire products are steadily going up, due more to improved lubricants and coatings than to increased machine speeds.

A new nail machine is being readied for the market. This machine is reported to be quieter and about twice as fast as present models.

A new method of galvanizing nails or other metal parts is available. No heat is involved.

Improved storage

Considerable interest is displayed in a new dry-descaling technique for rods and wire, with approximately six concerns (nationwide) using the process to replace acid pickling.

A new method of storing wire rods has been invented and installed in several mills. This method enables operators to get at any particular type of rod needed quickly and easily.

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OIL—

Refiners believe higher prices needed to bring West Coast demand into balance with supply

CALIFORNIA oil producers, who constitute the Pacific Coast's source of supply, are looking to higher prices as the only means by which supply can be balanced against increasing demand (61% in the last ten years) caused by population influx, greater industrialization and dominance of the automobile as a means of transportation in the area, plus recent military and defense requirements.

Imports from Canada by a new pipeline will help the situation, but a higher price level would increase exploration, development of marginal properties and secondary recovery activities. The President's Materials Policy Commission Report indicates a price advance of 2½ times from 1936 to 1950 resulted in reserves in the United States being more than tripled, and the footage of wells drilled more than doubled.

Even so, the supply will have to be augmented by domestic or offshore imports. To bring production up to demand, approximately 495,000,000 barrels of crude oil reserves would have to be discovered and developed annually over the next eight years, although for the last 14 years only 367,000,000 barrels annually have been added.

Total new supply, Union Oil Company estimates, will fail to equal demand by 211,000 barrels daily in 1955 and 567,000 in 1960. From a level of 1,125,000 barrels a day in 1951, a projection indicates a demand of 1,200,000 barrels daily in 1955 and 1,300,000 barrels by 1960.

The immediate situation, as reported by Standard Oil Company of California in its application to OPS for higher prices, is as follows:

	(Thousands of barrels daily) 1952	1953
Demand, excluding military	1,023	1,037
Military	145	147
Total	1,168	1,184
Supply	1,109	1,121
Indicated additional supplies required	59	63

But because California oil is a heavy product and the shortage lies principally in light products, Standard says the above figures understate the real deficiency of crude oil in the area.

Gasoline and distillate demands are expected to rise from 634,000 barrels daily to 655,000 in 1953. This is understandable, in view of the fact that taxable sales of motor fuels in the three Coast states plus Arizona and Nevada increased 8.6% in the first nine months of 1952 over the same period in 1951. However, residual fuel demand is expected to decline from 373,000 barrels in 1952 to 365,000 in 1953.

Petroleum Administration for Defense says the shortage is not due to inadequate refining capacity, because for 1952 the refineries operated at 81.4% of capacity, and in 1953 will run at 79.0%.

The first full-scale oil refinery in the Pacific Northwest, capacity 35,000 barrels, will be built by General Petroleum Corporation, using crude from the 24-in. Trans Mountain pipeline now being built from Edmonton to Vancouver. The refinery will be at Ferndale, 12 miles north of Bellingham, with a 40-mi. extension to the Trans Mountain line. Other oil companies have been reported on the verge of announcing refinery plans for the Puget Sound area, but nothing has developed.

After providing 38,000 barrels daily for the British Columbia market, the Trans Mountain Oil Pipeline Company expects to have from 40,000 to 75,000 barrels available for export. Some of the remainder, after the General refinery has been supplied, will undoubtedly be tankered to California. The line is to be completed next fall.

While a West Texas-California pipeline has been much in the news, informed opinion is not including Texas oil in its forecasts, although it is a possibility to keep in mind.

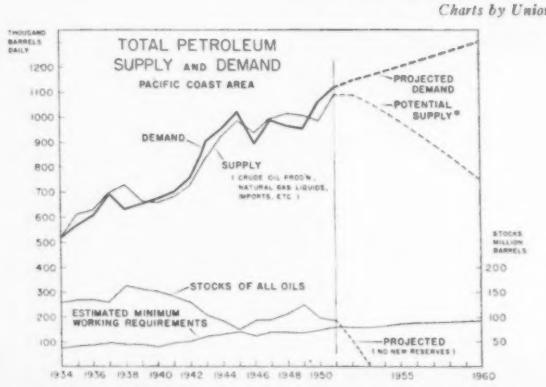
A new 8-in. pipeline from Salt Lake City to Boise, operated by Salt Lake Pipe Line Company, a Standard subsidiary, has boosted throughout from 22,000 barrels to 39,500 barrels daily. Continental Oil Company has a project to serve Spokane by a 25,000-barrel line from Billings, Montana.

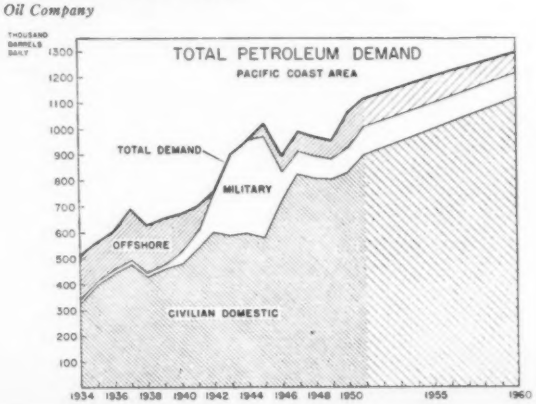
The most significant developments in the past two years, in refinery operation, have been the major improvement in catalytic reforming of gasoline for production of aromatics such as benzene, toluene, xylene, and the improvement of motor gasolines. These developments involve both (1) improved catalysts, and (2) change from fixed bed to a moving bed or fluid-type operation.

FOR A FORECAST OF OIL REFINERY PRODUCTION, SEE PAGE 87

MORE OIL NEEDED ALL THE TIME

Charts by Union Oil Company


TOTAL PETROLEUM SUPPLY AND DEMAND
PACIFIC COAST AREA
THOUSAND BARRELS DAILY
PROJECTED DEMAND
POTENTIAL SUPPLY*
DEMAND
SUPPLY
(CRUDE OIL FROM N., NATURAL GAS LIQUIDS, IMPORTS, ETC.)
STOCKS OF ALL OILS
ESTIMATED MINIMUM WORKING REQUIREMENTS
PROJECTED (NO NEW RESERVES)
STOCKS MILLION BARRELS
1934 1936 1938 1940 1942 1944 1946 1948 1950 1955 1960



GAS—

Customer increase of 6% reflects growth of the West — Canadian import situation explained

REFLECTING the continued population, business and industrial growth of the Western states, the gas industry in 1952 increased its customers by 6% and its gross revenues by 8%. There are now about 3,400,000 families and businesses using gas in the eleven Western states.

Sales in cubic feet were about 700,000,000,000 cubic feet, slightly less than in 1951, due to warmer than usual weather in both the spring and autumn months and to curtailment of steel processing during the strike. Expansion of facilities for service continued at a rate which strained the companies' resources in manpower and money. The money invested by gas utilities in the West is now close to $1,000,000,000.

Soon after the first of the year, California companies will be importing more than 1,000,000,000 cubic feet of natural gas per day from out-of-state sources, this being about 40% of their peak day requirements. Rates of most companies edged up somewhat during the year, but have experienced only a fraction of the increase of the other factors in cost of living. The American Gas Association reports natural gas rates up only 4.2% since 1939 as against a general cost of living increase of 88.7%.

The Canadian picture

Federal Power Commission's announcement that it will reconvene hearings on applications to pipe natural gas to the Pacific Northwest brought hope to Northwest utility companies that work on the line may begin early in 1953 if the Commission grants a permit to one of the competing companies this spring.

The Commission will reconvene February 16, in Washington, D. C., to study the natural gas picture for this area—the only region in the United States without a supply of natural gas.

Three firms, Westcoast Transmission Company, Limited, of Calgary, Alberta; Pacific Northwest Pipeline Corporation of Houston, Texas; and Northwest Natural Gas Company of Wilmington, Delaware, are making determined bids for the federal nod to serve this area.

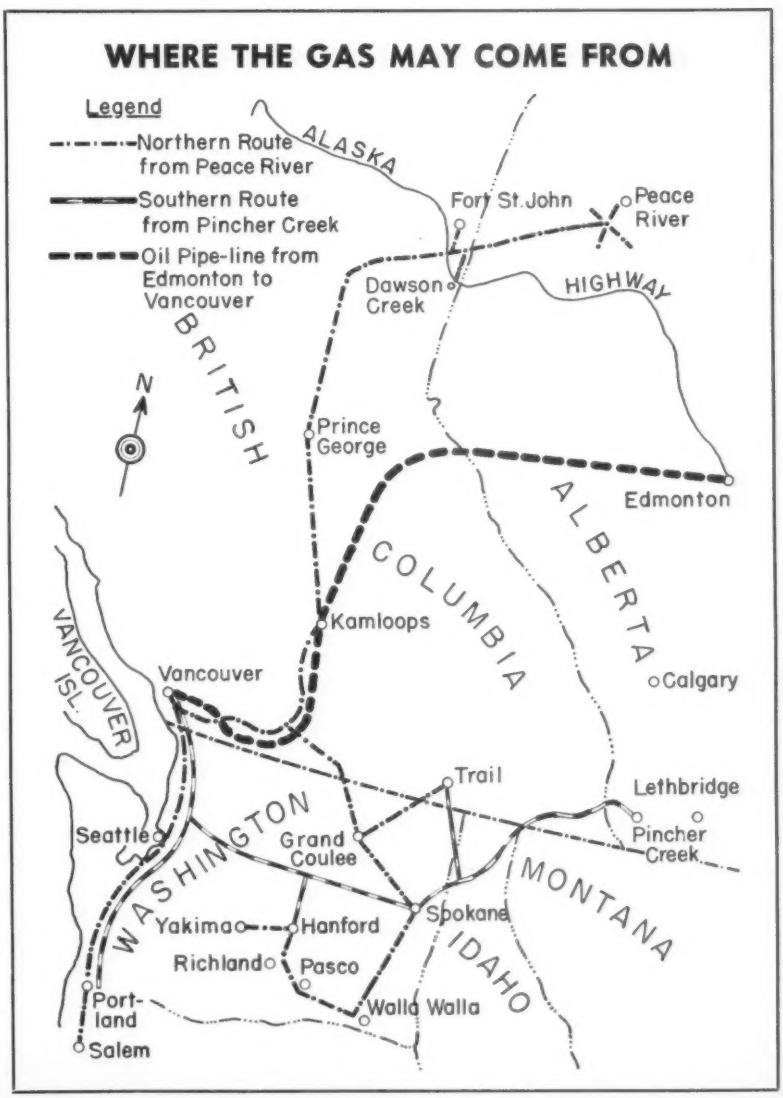
Westcoast Transmission already has the necessary permits from the Alberta Provincial Government and the Canadian Board of Transport commissioners to construct the line to the United States border. However, this line would not be economically feasible unless Westcoast were granted permission to cross the border and serve the Pacific Coast communities in the United States as far south as Portland, Oregon.

Westcoast President Frank M. McMahon stated in Portland in November that his firm has the financing for its proposed $111,000,000 project. Of the necessary financing, $86,000,000 has been lined up from insurance companies and banks, headed by Prudential Life.

The Canadian project would start in the Peace River area of Northwestern Alberta and Northeastern British Columbia, where the Provincial Government of Alberta has dedicated 12,000,000 acres in the Peace River area to Westcoast Transmission, which is part of 70,000,000 acres in Alberta and British Columbia that is available to Westcoast Transmission, according to McMahon.

The Westcoast Transmission route extends southward from the Fort St. John field, largest of nearly a score discovered in the Peace River region, and follows highway routes practically all the way, some 960 miles to Portland, Oregon.

In regard to gas fields and reserves,



by far the most impressive results to date in the whole general region of Peace River are being furnished by the drilling in the Fort St. John area of British Columbia, where a very large reserve is now indicated. The present reserve is based only on drilled wells and does not assess the undeveloped part of the Fort St. John structure, which, as revealed by geophysical exploration, is even larger than that on which the wells are now either completed or being drilled.

It has been estimated that the undeveloped gas reserves in the Fort St. John structure have the greatest reserve of any structure so far found in Western Canada including Pincher Creek. As of August 31, 1952, the estimated, proved reserves in the Fort St. John field were placed at 1.3 trillion cubic feet.

Future drilling in the Peace River area is expected to reveal many new gas fields because the area has been predominantly gas-bearing, and the presently-developed gas reserve of 2.5 trillion cubic feet for the Peace River area of British Columbia and Alberta should be greatly increased in the near future.

The Pacific Northwest Pipeline Corporation propose to serve the Northwest market with an all-American system, and stress that if they were to get the FPC nod, the complete system, including the source of supply, transmission facilities, the area to be served, the design and construction of the system and the sales price, would all be under the control of the Federal Power Commission.

Big business

Pacific Northwest Pipeline Corporation plans to construct a pipeline at an estimated cost of $138,000,000. The line would extend from the Four Corners area of New Mexico, through Colorado, Utah, Idaho, Oregon and Washington, serving markets of both the Northwest and the Intermountain areas. The major gas reserves of the company, located in the San Juan Basin field of New Mexico, are 1,300 pipeline miles from the Seattle market, and the Wyoming reserves committed to the project are approximately 900 miles from the Seattle market.

The San Juan Basin now has proven reserves in excess of 7 trillion cubic feet, and is estimated to have in excess of 15 trillion cubic feet of reserves when fully developed. The acreage contracted to Pacific Northwest Pipeline Corporation has about 2 trillion cubic feet of proven reserves, and is expected to have 3 trillion cubic feet proven with the completion of 20 additional wells.

Northwest Natural Gas Company hopes to begin construction of a pipeline from Pincher Creek field of southwestern Alberta. However, it not only needs the FPC approval, but also the permission of the Alberta Provincial Government to export, and a permit from the Canadian Board of Transport to construct a pipeline, neither of which it has at this time. The proposed line would cover 645 miles at a cost estimated at approximately $92,000,000.

The Pincher Creek field covers approximately 17,000 acres and is estimated to have 2.4 trillion cubic feet of gas. This is a "wet gas," which means that it has other products in it than the "dry gas" used for fuel. These products—distillates, butane, propane, natural gasoline and sulphur—are said to be worth twice as much as the dry gas content.

Regardless of who receives the permit from the FPC to deliver natural gas to this area—an area with a population of approximately 3,500,000 people—the movement of natural gas into the Northwest will be a valuable adjunct to the continued growth of the area. Natural gas would help alleviate the critical power shortage in the Northwest by saving an average of about 150,000 kilowatts a year, and it would also save the use of approximately 12,000,000 barrels of oil per year.

Bernard Goldhammer, an economist of the Bonneville Power Administration, gave an excellent summary of the need for natural gas when he said recently:

"Industry in general requires energy for heat and steam, for mechanical power in driving motors, and for electricity in electrolytic and chemical processes. The highest use of each of these fuels in the plant will provide the greatest efficiency and also the largest employment and income. If we can use natural gas for thermal energy, we will be able to move more of the electric energy up a step on the technological ladder and use it in chemical processes. In this manner we will secure the highest possible use of our resources."

Natural gas should attract to the Pacific Northwest certain industries which prefer closely controlled direct heat, providing greater industrial use of both gas and electricity.

GAS APPLIANCES—

West Coast water heater manufacturers supply nearly one-third of the total national output

FOR THE FIRST half of the year appliance manufacture and shipment continued dull, reflecting the buyers' market which set in early in 1951. The turn came during the third quarter during which gas appliance shipments to West Coast plants were up nearly 50% over 1951.

Water heaters are probably typical of the trend in gas appliance sales and will be about 7% greater in 1952 than in 1951, or 726,164 estimated units as against 678,658 in 1951.

Four Corners project

While there are no very good statistics on the magnitude of gas appliance manufacturing on the Pacific Coast, there can be no question but that it has grown to be a very big business indeed. The manufacture of gas water heaters alone will approach $30,000,000 of wholesale sales value in 1952, and in units will represent from one-quarter to one-third of all water heaters manufactured in the United States.

A confidential survey of a selected number of California gas furnace and heater manufacturers by the California State Chamber of Commerce showed that 27% of their total sales was to regions outside the eleven Western states.

The survey recommends ever-increasing study of establishment of branch factories in Eastern areas under California trained engineers because California was the first major area to use natural gas on a wide scale, and its appliance manufacturers therefore are at the top of the heap in technical knowledge.

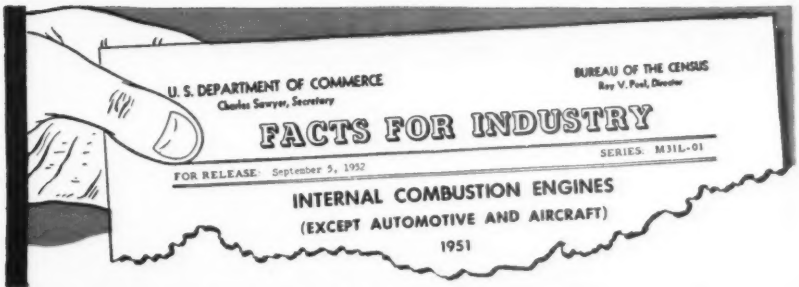
"Decentralization of industry is as feasible for prime Western producers as it is for their Eastern counterparts" comments the survey.

ANTICIPATED ADDITIONAL NEW CUSTOMERS FOR HOUSEHOLD HEATING

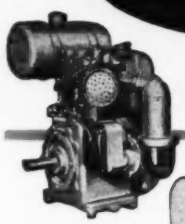
(From Gas House Heating Survey, American Gas Association, 1951)

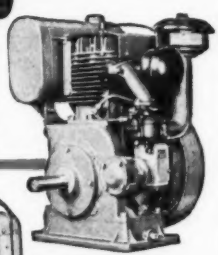
	1952-53 Season		
	New	Existing	Total
California	93,074	10,354	103,428
11 Western States	105,350	16,376	212,745

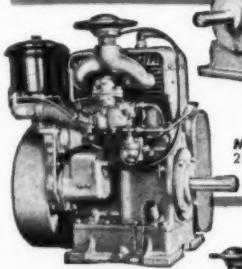
Latest Census Report Provides Proof of Overwhelming Preference for WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

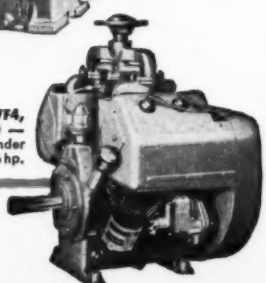

U. S. DEPARTMENT OF COMMERCE
Charles Sawyer, Secretary
BUREAU OF THE CENSUS
Roy V. Peel, Director
FACTS FOR INDUSTRY
FOR RELEASE: September 5, 1952
SERIES: M31L-01
INTERNAL COMBUSTION ENGINES
(EXCEPT AUTOMOTIVE AND AIRCRAFT)
1951

50.61% of Aggregate Total, 3 to 40 H. P. Engines made in 1950-'51 were WISCONSINS


Models ABN, AKN, AEN Single cylinder engines 3 to 8½ hp.


Models AFH, AGH, AHH — single cylinder engines 6 to 9 hp.


Models TE and TF 2-cylinder engines 7 to 14½ hp.


Models VE4, VF4, VP4D, VG4D — V-type 4-cylinder engines 15 to 36 hp.

It is no idle boast when Wisconsin Motor Corporation is referred to as "No. 1 Source" for Heavy-Duty Air-Cooled Engines. Overwhelming verification of this statement is established through statistics presented in a Bureau of the Census report, released on Sept. 5, 1952, covering the production of all types of internal combustion engines (except aircraft and automotive).

Based on figures contained in this report, 50.61% (1950-'51 average) of all engines produced within an 11 to 175 cu. in. displ. range (approx. 3 to 40 hp.) were Wisconsin Air-Cooled Engines, exclusive of outboard marine and so-called "captive" engines built by various manufacturers for use on their own original equipment.

Here is positive *proof of preference* for Wisconsin Air-Cooled Engines by builders and users of power-operated equipment in all fields where dependable, heavy-duty engine service is required. These engines have been *pre-judged* and *pre-selected* by more power-wise purchasers than all other makes of engines combined, within their power range!

This universal preference is based on such factors as ideal adaptability of Wisconsin Engines to fit both the machine and the job; easy starting and trouble-free air-cooling under all weather and climatic conditions; low-cost maintenance; ready availability of factory-trained servicing and original replacement parts . . . plus *outstanding performance.*

It will pay you to specify "Wisconsin Power" for your equipment. Complete descriptive and engineering data on request.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

ELECTRIC POWER—

Pacific Northwest may firm up its hydro with steam — "Intertie" and diesel sets to help out

FOR electric power, the Pacific Southwest is a "have" area because it has firmed up its limited supply of hydro with steam. The Pacific Northwest, where all hopes have been pinned on the great hydro potential, is a "have not" region because of (1) failure to develop the hydro fast enough, (2) the disregarding of steam.

It has been a relatively easy matter in California, because two large private utility companies and a few municipal systems dominate the picture. Washington and Oregon, however, constitute almost a jig-saw puzzle of moderate size private and municipal utilities, tiny public utility districts and one big federal system that controls the main stem of the Columbia River.

The result has been constantly increasing dependence on federal government appropriations to develop hydro, but the change to a Republican administration at Washington promises to work many changes in the picture.

First sign has been discussion of an "interstate authority" to replace the federal government's Bonneville Power Administration. Second is the possibility of larger public utility districts financing some of the hydro dams.

Third is a definite step toward providing the highly logical "inter-tie" between California and the Northwest that has been so vigorously opposed at both ends of the line; the former for fear it would stimulate further federal control, the latter for fear of having some of its scarce supply siphoned off to a more populated area. Fourth is the favorable attitude toward constructing two or more steam plants to firm up the hydro.

Increasing requirements

Meanwhile, requirements of the West for electric power continue to advance, and estimates for the future continually have to be changed. Growth of population and increased industrial activity plus greater per capita use of electricity, which outrun the forecasts, are responsible.

In the Western states, private utilities increased generating capacity from 3,618,000 kw. at the end of 1945 to 5,833,000 kw. at the end of 1951, a gain of 61.2%. By the end of 1954 it is expected the capacity will have reached 8,178,000 kw. This is 2¼ times the capacity existing at the end of World War II.

In the period from 1945 to 1951 major federal projects in the same area added 2,645,000 kw. The bulk of the federal additions were at Grand Coulee, Shasta, Keswick and Davis Dams. Planned additions to federal projects during 1952 to 1954 aggregate 1,016,000 kw.

December peak load is estimated as follows in megawatts (thousands of kilowatts):

	1950	1960
Federal Power Commission Region 7 (Oregon, Washington, Idaho, Utah, Montana)	4,963	10,500
Region 8 (Calif., Nev., Ariz.)	5,950	11,900
Wyo., Colo., N. Mex.	681	1,340

Peak demand in relation to dependable capacity (the capacity which could be supported on load curve by energy available in an adverse year) as figured out by the Federal Power Commission clearly shows the Pacific Northwest as a deficit area and the Pacific Southwest as having a surplus. Estimates in megawatts are as follows:

	Pacific Northwest		Pacific Southwest	
	Demand	Dep. Cap'y.	Demand	Dep. Cap'y.
1952	6,417	5,728	7,198	8,011
1953	7,184	6,532	7,802	8,811
1954	7,796	7,141	8,531	10,131
1955	8,286	7,626	9,054	10,762

Capacity of Region 7 would be about 800 megawatts higher under average stream flow than under adverse conditions, while Region 8 would have 250 megawatts.

POTENTIAL GENERATION
PACIFIC SOUTHWEST POWER POOL
(in millions of kilowatt hours)
Means of Generation

	Fuel	Hydro	% Fuel
Under average water conditions:			
1953	32,485	23,377	58
1954	40,754	22,579	64
1955	48,097	23,329	67
Under adverse conditions:			
1953	32,485	18,387	64
1954	40,754	16,138	72
1955	48,097	16,350	75

The 1952 season in the Pacific Northwest was the driest in many years, and necessitated sharp cuts in use of electric power by all large users. In a few more years new hydro may relieve the deficiency, although some pessimists wonder whether the supply will ever catch up.

Although it could not become available for two more years, at the earliest, the proposed inter-tie would provide relief for all but the worst years. California-Oregon Power Company has asked Federal Power Commission for authority to build two hydro-electric projects, on the Klamath River in southern Oregon and the McCloud River in California, and to connect up with the federal Bonneville system at Eugene and with Shasta Dam power on the other end.

By such connection, off-peak power from California could relieve the Northwest in its tight winter months, while in summer, when the Pacific Southwest has a heavy pumping load, surplus Northwest hydro now wasted could be transmitted southward.

Steam and diesel

Steam-generated power has been a virtual impossibility in the Northwest for any one utility because of capital cost, but Bonneville has been urging on Congress a $45,000,000 appropriation for three steam plants, one in the Portland area, one in the Puget Sound area, and the third near Coos Bay. Desirability of the Coos Bay project is questioned, but possibility of the Pacific Northwest Power Pool sponsoring the other two plants seems to find considerable favor.

If the steam plants were only operated to meet peak demands, i.e., at 50% load factor, it is estimated that they could produce power for four mills or less, which is around half the cost of energy in California.

For emergency purposes, it seems likely that many industries will install diesel generator sets. Surplus sets are not nearly as available now as at the conclusion of the war, and the buyer has his choice between waiting for a long period of time for factory delivery of a new set or buying a used unit that may be either too large or too small.

Nevertheless, many will be forced to purchase diesel sets as protection against expanded volume of business in their plants or as a standby against power failure.

Small concerns using up to 500 kw. can be readily supplied with units, and information supplied to *Western Industry* by one dealer specifies that a 500-kw. generator would require a 900 to 1,000-hp. engine to pull the load, while the unit would cost around $50,000. Operating cost would be about $2,000 a month. Amortizing the investment over a ten-year period, approximate life of the unit, would make the operating cost total $29,000 a year.

COAL—

Higher wage levels will force some tunnel mines to close up, while others should mechanize

THE economy of the Western coal industry appears to be the Mr. "X" of the year. Authoritative sources in Colorado seem pessimistic; authoritative sources in Utah are optimistic. *Western Industry* will report what information is available from both sources, and let the reader be the judge.

Impact of the latest wage increase on the industry in these areas is yet to be felt in full force but the probability is that some tunnel mines, particularly those with high labor costs, will either have to mechanize or fall by the wayside.

First, the bright side, from Utah. "Anyone who sells the Western coal industry short is making a mistake," says B. P. Manley, executive secretary of the Utah Coal Operators Association. In his opinion, the competitive intrusion of oil into the heating field, especially industrial, has reached or is approaching its peak. The supply is limited and the product has so many uses of higher value that its utilization as an industrial fuel is bound to decrease. The same general logic applies to gas.

The big aces claimed by the coal industry are:

1. For all practical purposes the supply is inexhaustible.
2. Deposits are so located that all parts of the West can be supplied without an unreasonably long haul.
3. Industries using coal can always be assured of an adequate and continuing supply. Even work stoppages can be guarded against by stockpiling, which is impossible with gas and expensive with oil.
4. Efficiency of coal burning equipment is being constantly improved. The new Gadsby plant of Utah Power & Light Company, for example, will generate electricity at a fuel cost of .8c per kilowatt hour.
5. Population increases and industrial expansion in the West are enlarging the fuel market. For instance, the Hanford plutonium plant in Washington now uses 600,000 tons of coal a year, and planned expansions of this establishment will increase it by 100,000 tons.

From Colorado the picture drawn is considerably different. Underground mines in the Rocky Mountain region are now largely a memory. Oil and gas consumption has to a large extent put the coal business on the rocks. Added to this, wage costs are now such that only the most highly mechanized mine can pay expenses, much less operate at a profit. The stripper, with his lower production cost, is about the only man who can make a go of it.

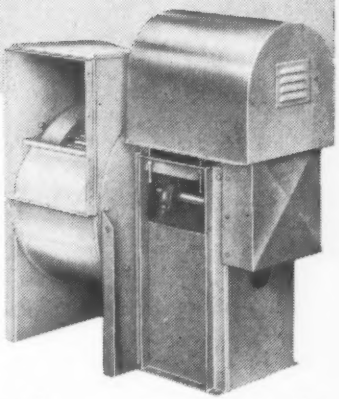
A number of coal properties have gone to the wall in the last few years. There has been but little incentive for operators to purchase newer and more modern machinery because (1) there was little or no market, (2) they could not see the advisability of buying a new harness for a dying horse. Another handicap is the dearth of younger men, who are so valuable for motormen, roperiders, etc.

Despite all this, there are 22 continuous miners in use in the Rocky Mountain coal mining area. Several of the larger manufacturers are developing augers of different types. Most of these are still in the experimental stage. Coal conveyors, while not in general use, are slowly gaining in favor; the drawback is their high initial cost.

Roof bolting, an advance in the direction of safety, is having much attention paid to it, and the results, taken as a whole, have been very good.

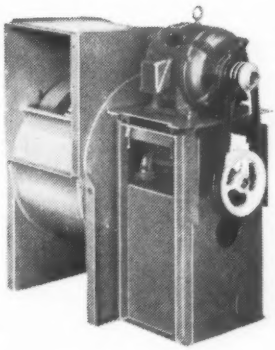
Production for the eleven Western states for 1949 was 21,912 tons, for 1950 21,816 tons, and for 1951 20,949 tons.

Now . . . simplified installation with the ALL-PURPOSE VENT SET



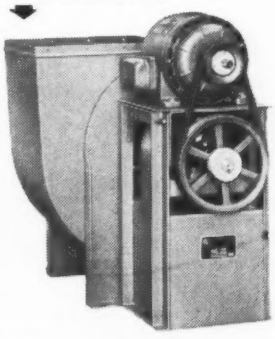
This self-contained vent set combines blower, motor and drive in one package, making installation easier and more inexpensive. These sets are available in a complete range of sizes up to 15,000 CFM and are suited for any kind of exhaust or air supply problem.

Designed for convenience, the motor is mounted high where it can be easily observed and serviced. Adjusting belt tension is also simplified, requiring only the turning of the leveling screws in the four corners of the motor bed plate.



Where installation is made outdoors, unit is equipped with weatherhood for protection of motor and drive. Hood is easily and quickly removed for inspection and adjustment of belts.

All-purpose vent set, Class II construction with heat slinger and bearing cooling fan for induced draft service.



All standard MASTER vent sets are of regular Class 1 or heavier construction. Standard performance ratings apply. You will find MASTER all-purpose vent sets more efficient in performance, quieter in operation and easier to service. Specify MASTER FANS for your next air moving job.

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ATOMIC ENERGY—

Big money is being poured into expansions of all the AEC's Western plants and laboratories

THE ATOMIC ENERGY programs have taken great strides forward during the year 1952, both in research on industrial uses of atomic energy and greatly increased exploration and plant building uses.

At Richland, Washington, the Hanford Operations Office of the Atomic Energy Commission ended 1952 by completing a two-year expansion program and starting a new construction phase to continue into 1955. Since 1950, about $180,000,000 of new construction has been completed at Hanford, and when the current building phase is completed in 1955, the total construction cost will reach about $1,000,000.

$110,000,000 contract

Late in 1952, Kaiser Engineers Division of Henry J. Kaiser Company started work on a new $110,000,000 prime construction contract for the Atomic Energy Commission at Hanford. During 1952, production was increased and cost per unit of plutonium was substantially reduced as production of plutonium became more like normal industrial manufacturing. General Electric operates the Hanford Works for AEC.

A second reactor was brought into production at the Atomic Energy Commission's National Reactor Testing Station in Idaho this year at a cost of $18,000,000.

Work continued at the NRTS on construction of a prototype submarine thermal reactor. Westinghouse Electric Corp., the prime contractor, is developing the reactor jointly with Argonne National Laboratory. At year's end, the $34,000,000-chemical processing plant, designed to recover uranium from irradiated fuel components of reactors, was nearing completion. The plant is operated by American Cyanamid Co. of New York.

The bid opening date for first construction of ground testing facilities for a prototype aircraft propulsion reactor has been set for January 30, 1953. Bidding will cover construction of an assembly and maintenance area and an administration area. Total cost of the test facilities, G-E operated, is expected to approximate $33,000,000.

At Los Alamos

In Los Alamos, New Mexico, construction costing over $23,000,000 has produced the Van de Graaff accelerator, power and steam plant, experimental process buildings and a community center and housing. New construction now under contract for experimental research totals over $18,000,000.

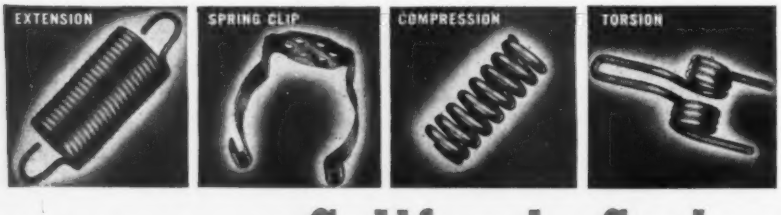
Construction work completed at Sandia Base, Albuquerque, New Mexico, during 1952 cost nearly $4,000,000. Projects include additions and conversion of buildings, machine shops, etc. Current work under way amounts to $2,000,000 for a medical building, dock facilities, etc.

A $3,500,000 Cryogenics Laboratory and plant near Boulder, Colorado, was completed during 1952.

Construction of $45,000,000 Rocky Flats plant, near Denver, Colorado, reached a peak in July and completion is anticipated in early 1953.

Hope springs eternally... Pogo springs have given way to piston rings in moving personable young ladies from one place to another. But western industry—that's everyone from Phoenix to Pogo Pogo—still looks to California for the best springs for any purpose.

We stock the West's largest selection of Springs.



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Stanford Research Institute went into the business of providing a center of investigation of industrial applications for nuclear energy last year with arrival of ten lbs. of radioactive cobalt 60. The cobalt, stored safely in a 5,400-gal. pool of water, is the largest radioactive source outside of AEC installations.

AEC contracts have been awarded liberally in the West in general, and in the Colorado Plateau area in particular.

There are eight mills in the Colorado Plateau area processing uranium ores, and two new mills under construction. The Plateau itself takes in an area of some 65,000 sq. mi., and reaches into four states, Colorado, Utah, New Mexico and Arizona.

Mining at peak

Organized prospecting has hit an all-time high with private companies spending over $3,000,000 a year on drilling alone. Mining activities are also at a peak with well over 200 uranium mines in operation in the area. Transportation problems in this vast area are being met by a $4,000,000 access road program, sponsored by AEC.

United States Vanadium Company has doubled in capacity as result of an expansion program started last August. This mill, located at Uravan, Colorado, is the largest uranium one-treatment plant in the nation.

Two new plants, Vitro Chemical Co., at Salt Lake City, Utah, and Climax Uranium Co. at Grand Junction, Colorado, reached full production of uranium during 1952, and two new purchase stations, Shiprock and Grants, New Mexico, commenced receiving ores representing expansion to new areas and increased ore production.

American oil men have submitted a plan to the AEC for hunting for uranium along with the billion-dollar-a-year hunt for oil. The plan, testing for uranium in the many test holes drilled every day, greatly increases the limits within which radioactive ore can be discovered.

STEEL BOILERS—

MORE BOILERS were shipped from manufacturers during 1952 than in 1951, but their average size was smaller. Increase in residential boiler demand is partly accounted for by a growing demand for radiant heating and the fact that this type of heating is being installed with the use of panels, baseboard radiation, or convectors at a very reasonable cost.

Also noted is an increase in use of forced hot water, as compared to steam.

Steel-strapped pallets at Locke Department of General Electric Company.

Packing expense cut 35% by Brainard Strapping Service

THESE porcelain insulators were formerly packaged in individual cartons. Then Brainard strapping salesman Edward Rose of Baltimore, in cooperation with his customer's Packing Engineer, developed this method of loading groups of insulators on a returnable pallet, and securing the entire unit with Brainard steel strapping.

Excessive breakage of previous fasteners used has now been eliminated, and packing expense cut 35%.

Developing improved methods of materials handling and shipping is a standard service of Ed Rose and his fellow Brainard salesmen. They are qualified to study your operations, then recommend *and demonstrate* the most efficient system for you.

Call your nearby Brainard salesman for top-notch service in steel strapping. In Los Angeles: 1151 South Broadway St. In San Francisco: 717 Market St.

COMPLETE STEEL STRAPPING SERVICE. LIGHT AND HEAVY DUTY STRAPPING, TOOLS AND ACCESSORIES

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For illustrated catalog write Brainard Steel Division, Sharon Steel Corp., Dept. Q-1, 717 Market St., San Francisco.

WARREN, OHIO

PLASTICS—

Western fabricators now use about one-third of entire national polystyrene material production

OVER ALL, the plastics business was a little below normal during the first half of 1952 except for a slight rise in March reflecting depleted inventories. The plastics industry as a whole, and particularly in the West, enjoyed a rising market from July until the end of the year, and indications are that this will continue into the first quarter of 1953 despite a slacking off of certain plastic products which are in heavy demand during the holiday season.

Practically all plastic materials reacted to the rebound in business during the last half of 1952. The consumption of phenolic materials, which are used principally in industrial, automotive, appliances and electrical parts, increased about 15% over 1951. Estimated consumption of phenol formaldehyde molding compounds in the West at present is about 5,000,000 lbs.

Multiple carloads

Polystyrene material, which is used by injection molders in production of housewares, toys and other proprietary items, is probably the highest volume material used in the West, and the 1952 total is estimated close to 30,000,000 lbs., or about one-third of the entire use of this material in the United States. Many manufacturers are ordering this material in multiple carload lots and it has become a major part of the Western plastics industry.

Polyethylene materials increased rapidly during 1952 as the impact and rubber-like character of the material made it particularly useful in fabrication of articles subject to impact conditions. A substantial part of polyethylene material is used by plastic extruders who produce film and sheet for extensive application in the packaging industry. Other uses where flexible plastic is required are increasing and the future for this type of material looks very bright.

36-FOOT U. S. Navy workboat fabricated at Bremerton navy yard in 1952 is the largest plastic casting ever made in closed molds.

The market for urea formaldehyde materials, although still small in the West, has increased about 10% and consumption of this material is running approximately 2,000,000 lbs. a year. Melamine materials used particularly in dishware and electrical parts because of its fine dielectric properties, increased slightly and approximately 2,000,000 lbs. of this material were consumed in the West last year.

Competing with East

Vinyl film is used extensively in packaging, garment and house furnishings industries, and calender equipment for production of this film, which is the first unit of its type west of Chicago, was installed in the West last year.

There are several fabricators of this material in the West. Although the market is very competitive, Western manufacturers have found it feasible to compete on many items with Eastern fabricators.

Vinyl resins in addition to sheet and film are also used to insulate wire, extruded to form garden hose and are now being used extensively in the phonograph record industry. Estimated consumption of vinyl resins in the West at present run about 50,000,000 lbs., according to the B. F. Goodrich Chemical Company.

Use of reinforced plastics materials is good, but consumption is not exceeding capacity. Major portion of these materials is being used in government and military applications, but many commercial developments are appearing and the future looks good for use of these types of materials which include glass cloth, glass mat and glass thread robings.

Some of the most interesting applications last year were development of pipeline and a special utility sled for use by the Army in Arctic zones. This particular segment of the industry has developed faster in the West than other sections of the country and most research, engineering and development of equipment to process this material has been completed here.

During 1952 several improvements were made in production methods, most of them dealing with electronic preheating, preheating of thermosetting materials and conductive heat of thermoplastic materials to increase production speeds.

Larger and larger parts are being produced from all materials, such as console cabinets for television sets from phenolic materials, complete refrigerator doors from thermoplastic materials, and storage tanks from reinforced glass fiber materials.

Being basically a chemical industry, new materials are constantly developed, and patented weekly. Although it takes years to develop these new materials commercially, there is always a possibility of one of them becoming as important industrially as the styrenes or phenolics have been in the past.

Hundreds of new plastic products and plastic components are put on the market annually and engineers and designers are finding that the physical and chemical properties of these materials coupled with the flexibility of design and range of color make them attractive materials for their use.

APPAREL—

Los Angeles is ranked as the second largest manufacturing center in the entire world

WESTERN garment makers at year's end looked to newly suspended price controls on most apparel lines as but a minor means of restoring narrowed profit margins. Industries laid most of the past twelve months' difficulties to consumer resistance and slowly climbing overhead costs. The industry was plagued, too, by heavy labor turnover caused by the attraction of higher wages in defense industries.

Los Angeles today ranks as the second largest apparel manufacturing center in the world, according to a report recently published by the Market Planning Division of the National Credit Office, a Dun and Bradstreet subsidiary. It now takes the lead over Chicago, Philadelphia, Boston, St. Louis, Paris, and London, and is second only to New York, both in the number of firms, unit production, and dollar sales.

AUTOMOBILES—

West Coast assembly for 1952 drops off considerably — Steel strike is partially responsible

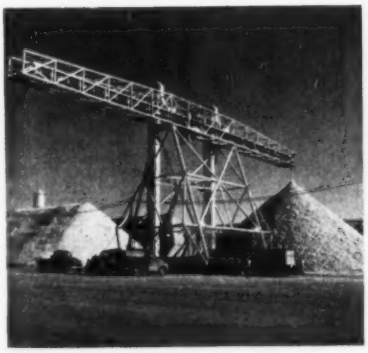
AUTOMOBILE ASSEMBLY on the West Coast in 1952 again dropped considerably below previous years' output. General Motors and Ford showed decided drops, while Chrysler had a slight increase. Nash and Willys-Overland were the only other assemblers to show an increase, and Kaiser-Frazer shut down its West Coast assembling plants.

Figures submitted by the various automobile manufacturers are as follows:

AUTOMOBILES
(Source: Bureau of the Census)

Company	Make	1952	1951
Chrysler	Plymouth	43,960	49,249
	Chrysler	10,229	10,764
	DeSoto	10,121	—
	Dodge—		
	cars	21,809	26,181
	trucks	13,945	13,119
Total Chrysler production		100,064	99,313
Ford	Ford—		
	cars	74,982	92,246
	trucks	15,800	25,706
	Lincolns	2,761	1,739
	Mercury	28,763	30,345
Total Ford production		122,306	150,036
General Motors	All types	209,777	260,273
Nash	Nash	15,939	11,750
Studebaker	Studebaker	19,700	28,200
Kaiser-Fraser	Kaiser	shutdown	2,384
Willys-Overland	All types	10,458	7,035
Total cars and trucks assembled		478,244	558,991

COTTON HANDLING—



GANTRY-TYPE cottonseed stacker at Producers Cotton Oil Company mill at Phoenix. Fabricated and erected by Consolidated-Western Division of U. S. Steel. Seed is trucked to the yard from the gins and unloaded on horizontal belts at bottom of the stacker. Elevator belts carry the seed up to the top cross members, where stacking belts pick it up and deposit it on the stacks. The stacks can be piled on each side of the machine simultaneously.

*Snap-on VACUUM GRIP PLIERS ...the right pliers for every job!

● Choose from more than 30 Snap-on types and sizes. Each is built to perform its specific gripping, cutting or twisting function *faster, easier, more safely* than any other pliers. Snap-ons are heat-treated from surface to core and the jaws, cutting edges and joints are locally tempered to exact degree of hardness and toughness for greatest durability. Write for catalogs described above. Snap-on branch warehouses in 42 industrial centers offer direct factory service to industry everywhere.

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MINING—

Operators diversifying their activities, and going in for detailed time and cost studies

MINING COMPANIES are beginning to exhibit a trend toward diversifying their activities into various metals and non-metals and related industries, so that a poor market in one will not jeopardize their entire operation. A case in point is Anaconda Copper, who enters the aluminum field.

High cost of labor and scarcity of highly skilled labor are forcing mining companies to mechanize more of their operations. In order to mine lower grade ores economically, the high cost of labor must be compensated for by higher productivity.

Detailed time and cost studies have become the instruments for developing better methods and better equipment. Materials handling studies have pointed the way to handling larger units with lower labor costs, i.e., larger cars, larger locomotives, larger skips, and carefully integrated production cycles.

In the drilling cycle, emphasis has been on increasing the per cent of time spent drilling and reducing the per cent of time in non-productive work such as changing drill rods, positioning drill, setting up and tearing down drill.

Long drill rods are used with detachable bits. In tunnel headings drill carriages are favored with one, two, or three booms mounting long power-feed shells and high speed drills. For less accessible places such as stopes, raises, and winzes the light, versatile push feed bits are favored. In soft and medium rock, detachable slip-on steel bits yield the lowest cost. In hard rock, however, detachable slip-on tungsten carbide bits yield the lowest cost.

The trend toward mechanized handling of timber and supplies continues. Fork lift trucks are used to transport and pile palletized or steel-strapped unit loads, thus providing more economical handling and storage of mine supplies and timber.

A typical example of the trend toward better utilization of natural resources is the increasing use of laminated skip guides. A less expensive substitute for the solid timber guide has been developed. These laminated guides are available with hardwood inserts designed to increase wear resistance.

Rock bolts are gaining favor in metal mines as a means of stabilizing underground openings. They provide ground support at a lower cost than timber and require less excavation and handling of rock in attaining a specified clear cross section.

COPPER—

Development operations on tremendous scale in progress in Nevada, Arizona, Utah and Montana

BIGGEST copper mine in the country, located 50 mi. northwest of Tucson, Ariz., owned by San Manuel Copper Corp. (subsidiary of Magma Copper Co.) was granted, in late 1952, the largest RFC loan to that time: $94,000,000, for development of the mine and processing the ore.

Kennecott Copper Corp., in the fall of last year, started to move the entire town of Ruth, Nevada, in order to copper mine under its location. That deposit is believed to contain 22,500,000 tons of commercial grade ore.

Bagdad Copper Corp., Hillside, Arizona, has a guaranteed market by Defense Materials Procurement Agency, for 27,000,000 lbs. of copper. This plus a guaranteed market for 940,000 lbs. of molybdenite a year will enable the firm to produce 35,000,000 lbs. of electrolytically refined copper a year and 12,000,000 lbs. of recoverable copper.

Arizona mining companies will spend about $200,000 in expanding copper production facilities during 1953 and 1954. This means a possible 32½% increase in state's total copper tonnage; a potential hike of $65,640,000 in value of its metal products, and an anticipated total annual payroll increase of $16,898,000 resulting from 3800 new jobs.

Anaconda Copper Mining Co. will probably start open pit operations before the end of this year in their New Yerington plant. Estimated 60,000,000 lbs. of copper per year during the first two years, and 66,000,000 lbs. annually thereafter will be crushed and leached at this plant.

Anaconda's Greater Butte, Montana project started in operation early last year, with plans for a 6,000 ton-per-day output, to increase to 15,000 this year.

Most segments of the copper smelting industry operated at capacity during 1952, and this situation will probably prevail in the immediate future.

FOUNDRY CONSUMPTION OF BRASS INGOT

In Short Tons
(U. S. Bureau of Mines)

	1949	1950	1951
Colorado, Arizona and New Mexico	139	265	521
Utah		44	34
Idaho	7	7	5
Montana		3	4
California	10,969	16,033	20,188
Oregon	169	246	78
Washington	169	203	444
Total Western	11,743	16,801	21,274

MINE PRODUCTION OF RECOVERABLE COPPER

In Short Tons
(U. S. Bureau of Mines)

	1949	1950	1951
Arizona	359,010	403,301	415,870
Montana	56,611	54,478	57,406
Nevada	38,058	52,569	56,474
New Mexico	55,388	66,300	73,558
Utah	197,245	278,630	271,086
Total Western (Includes Calif., Colo, Ida., Ore., Wash.)	716,097	866,248	884,783
Total U. S.	752,750	909,343	928,330

Smelter practices

The only really significant change in smelting practices in recent years is at the Ajo, Arizona, plant of the Phelps-Dodge Copper Corp., where slingers are used to introduce the wet concentrate charge on top of a deep bath of matte and slag in the reverberatory furnace. This compares with the conventional wet charge practice of depositing the charge along the sidewalls in a furnace which has a rather shallow bath.

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7. **FLEXIBILITY** . . . Republic Drills have strength on the cutting edge plus flexibility.
8. **LONGER LIFE** . . . because they're tough where they need to be, actual plant records prove Republic Drills last up to ⅓ longer.
9. **COMPLETE SIZE RANGE** . . . covers all types of work with superior accuracy.
10. **COMPLETE STOCKS** . . . TRIANGLE has on hand big stocks available for immediate delivery.

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CAPEWELL HACK SAW BLADES

ALUMINUM—

Power shortages curtail factory production as Western facilities undergo expansion program

ALTHOUGH long-term outlook for Western aluminum industry remains bright, record drought in the Pacific Northwest has had strongly adverse effects in the latter half of 1952 and affects prospects for at least the early months of 1953.

Power shortages resulting from low water have sharply cut output of the reduction plants of the three major producers in Washington and Oregon. Even heavy winter snow and rain cannot relieve the situation materially until after the spring thaws.

At the same time, last summer's steel strike somewhat delayed construction of new aluminum reduction plants in southern states. Consequently, although total national production was expected to reach an all-time high of 935,000 tons, 12 per cent above 1951, the gap between forecast and actual production is expected to cause federal controls on aluminum usage to be extended longer than originally intended.

Expansion

Kaiser and Reynolds have expanded capacity of their Northwest smelters, and Alcoa has built a new 170,000,000-lb. facility at Wenatchee. Opening of the second potline at this plant was delayed by power shortage which has hit the older plants.

In the spring, Anaconda is due to begin construction of an aluminum plant at Columbia Falls, Montana, using power from Hungry Horse Dam, with completion scheduled for early in 1954. This has unusual interest and importance because it signals entry of a major copper producer into aluminum production. Alcoa also has plans for a project near Skagway, Alaska, to produce 200,000 tons of pig annually, while the Aluminum Company of Canada's big British Columbia mill will come into operation in 1954.

Just before Christmas the Defense Production Administration approved construction of a 54,000-ton reduction plant at The Dalles, Oregon, for the Harvey Machine Company of Torrance, Calif. The Harvey organization announced that DPA approval included an ore treatment plant to reduce bauxite from Guiana into alumina, and that the company plans to build a pilot plant, probably near Salem, for use of Columbia Basin ores.

Expansion of primary aluminum capacity elsewhere in the United States will benefit Western users because it helps bring national demand and supply into closer balance. By 1954 national primary capacity will total about 3,500,000,000 lbs. of aluminum, and the government is now encouraging another round of expansion. Olin Industries of Alton, Illinois, have already been granted tax write-offs for a primary reduction plant and aluminum sheet mill.

New products

Besides enlarging their reduction plant capacity, the three major aluminum producers also are enlarging the range of mill products produced in the West, which will be of benefit to fabricators. Kaiser is installing new equipment at its Trentwood mill and during 1953 will begin production of welded tubing. Reynolds is expanding facilities as well at its Phoenix, Arizona, extrusion plant, and Alcoa is widening the range of products produced at its Vancouver, Washington, rod mill.

The national aluminum market, it is estimated, will grow to nearly 5,000,000,000 lbs. (including secondary metal) by 1960, as compared with 2,300,000,000 lbs. actually sold in 1950.

This expected growth is attributed largely to three factors. Aluminum is the low-cost, non-ferrous metal. The greater availability of aluminum will encourage new and large-volume uses. Development of semi-automatic welding, plastic bonding, cold welding and other advances make it easier to fabricate and join aluminum.

Oil tank trucks

Among interesting Western aluminum progress made in 1952 was the success of aluminum tank trucks and trailers for the transport of petroleum products and development by Kaiser Aluminum researchers of the first practical method of casting 32-in. diameter ingots for use in heavy forging and extrusion presses to produce structural parts for the aircraft industry.

CMP controls have prevented many new applications of aluminum and expansion of already established uses. So far as the West is concerned, this is particularly true of uses connected with building and agricultural industries such as roofing and siding. A study of the Pacific Northwest aluminum industry by William Sibley while a student at Reed College, Portland, estimated that 20,000,000 lbs. of aluminum could have been sold in the West in 1951 for sprinkler irrigation systems if the metal had been available. (1950 Western sales estimated at 4,000,000 pounds.)

Sibley reported that 75 per cent of all aluminum used in the West is in the form of sheets, and Western sheet consumption was estimated at 153,882,800 lbs. in 1949 and 183,345,000 lbs. in 1950, with total demand ranging from 150,000,000 to 185,000,000. Boeing consumed 4,732,000 lbs. in 1949, mostly in the form of sheet. The aluminum weight of ACSR cable installed in 1950 by Bonneville Power Administration, U. S. Bureau of Reclamation and other Western public and private power firms was given as 18,250,598 lbs.

PRIMARY ALUMINUM PRODUCTION
(short tons)
(from William E. Sibley thesis)

Year	Total U. S.	Pacific N.W.	Pacific N.W. %
1948	623,456	295,000	47.3
1949	603,462	311,400	51.6
1950	719,000	343,000	47.7
1951	836,881	367,000	43.9

SILVER AND GOLD—

Now high resistance alloys find industrial markets in the West for use in new guided missiles

GOLD, that shining metal which used to be used for money, is finding a new value in industry. Silver, its former running mate in the money markets, is finding a like value in industry, particularly in the West, where there is an increasing demand for special alloys of gold and silver in electronic applications.

Alloys with elements having high vapor pressure are used for joining components in vacuum tube elements. Corrosion resistance and high electrical conductivity of precious metals in electronic parts for guided missiles is also being investigated and applied.

Silver paint for printed electronic circuits and terminal contacts on ceramic resistors and condenser elements is a new application of an old product on television and precision electronic circuits.

Overall demand for alloys of silver and gold and other precious metals is growing directly with the increased

If you can't take it with you . . .

"Meat costs so much these days, it's cheaper to eat money." So saying, Ezra pulled out a plug of 14k Fort Knox brand, chomped off about a half-ounce bite, and . . .

Gold used to be used for money. Now they dig it out of the ground, refine it, and put it back into the ground again at Fort Knox.

overall industrial picture on the West coast, and production facilities to meet this demand are continually expanding.

While considerable increase has taken place in the use of silver brazing alloys on munition contracts, the controls on non-ferrous metals have naturally affected civilian consumption and demand has only slightly recovered from an initial set-back. Fortunately, requirements of high production heating equipment for such contracts indicate that they will be used for civilian production along with munitions work, boding good promise for future demand.

NON-FERROUS WIRE PRODUCTS—

A NEW tire coating process has been introduced for copper wire, an electrolytic process using an alkaline electrolyte that is faster, nontoxic, non-critical, and that can closely control the coating thickness.

A new cold pressure welding process for aluminum and copper wire and other forms of metal is being offered by the General Electric Co., Ltd., of England. This process may be used on a license basis. Butt, lap, and cross wire welds are being made that are said to be as strong or stronger than resistance welds.

COLD-FINISHED STEEL BARS—

WESTERN production of cold finished steel bars in 1950 was 19,860 tons. In 1951 that increased 100% to 40,136 tons. Last year's estimate will show a moderate increase from that figure. Only three Western firms produce cold finished steel bars: Sierra Drawn Steel Corp., Pacific Tube Co., and Union Drawn Div. of Republic Steel Corp.

Eastern imports of cold finished bars into this area have been materially reduced, first because of the rearmament program, and secondly because of the 1952 steel strike.

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STEEL—

Steel production in the West jumps to 6% of the total output as new plants are completed

THE WESTERN bloc of states is presently producing about 6,200,000 tons of steel per year, or six per cent of total national output, compared with negligible production before 1942. Per capita Western consumption of steel is about 1,400 lbs., based on a population of 19,360,000.

Utah, Washington and Oregon, in 1951, produced 1,964,006 net tons of ingots and steel for castings. Plant capacity in those states is 1,899,920 net tons. Production therefore was at 103.4% of capacity, up 9.3% from 1950.

California produced in 1951 2,832,234 net tons of ingots and steel for castings, operating at 103.5% of capacity (2,736,600 net tons) up 13.3% from the previous year.

Colorado, Utah, and Oregon each have one steel producing plant; Washington has four, and California has ten. Kaiser has completed a tinplate mill at Fontana, at a cost of $25,000,000. This mill has a capacity of 200,000 tons of tinplate annually.

In addition to this, Kaiser also embarked upon a $65,000,000 expansion including a new blast furnace (total now 3), a new open hearth furnace (total now 9), 90 new coke ovens (total now 225), and added two stands of rolls to the four-stand hot strip mill.

Bethlehem is enlarging furnaces at South San Francisco and Seattle in a continuing program designed to have them all of 75-ton capacity. At the Vernon plant, the company is developing smoke control from electric furnaces to comply with the local smog abatement laws. This will be the first time that emissions from electric furnaces have ever been controlled.

Colorado Fuel and Iron Corp. spent, during the fiscal year ending June 30, 1952, over $20,000,000 for expansion and modernization. This compares with $8,470,255 in the previous fiscal year period. C. F. & I.'s important new development is the new seamless tube mill, now under construction at the Pueblo plant. This will be the first production of oil country goods pipe, principally seamless casing and tubing, in the West.

C. F. & I. also opened a new bituminous coal mine in southern Colorado, called the Allen mine. This will be an important source of coking coal for the Pueblo steel plant.

Columbia-Geneva Steel Division of United States Steel Co., Geneva, Utah, plant added, during 1952, one more (the tenth) open hearth furnace, with 160,000 net tons capacity. This brings to 1,600,000 net tons the total annual open hearth steel producing capacity at Geneva.

A second furnace soaking pit battery was also added. Geneva is also in process of installing new hot roll sheet facilities.

Columbia-Pittsburg is engaging in the second postwar multi-million dollar expansion program, including addition of 15 acres under one roof for the sheet and tin mill. New equipment includes: a pickling line, a four stand cold reduction mill, a continuous galvanizing facility, an electrolytic (high speed) tinning line, which augments the present line brought in during 1948.

This expansion brings the total sheet and tin mill annual production capacity to 540,000 net tons annually.

First of last month, Seidelhuber Steel Rolling Mill Corp., Seattle, started production in its new rolling mill. Next expansion projected for this year is more roll stands so that the plant can produce merchant bar sizes from billets.

Chester K. Sterrett, manager of new industries department, Portland Chamber of Commerce, says the Pacific Northwest needs additional basic steel production, particularly in the form of light gauge sheets. Raw Materials Survey, Inc., is studying whether the area is an economic location for a blast furnace or an open hearth steel plant.

STRUCTURAL STEEL—

Western production for 1952 increases due to heavy building programs during the past year

IN GENERAL, production of structural steel in 1948 was quite high, probably around 80% of that in 1951. Construction in 1949 was slow, and 1950 was also slow for the first six months until the beginning of the Korean conflict. 1951, taken as a whole, was just fair; 1952 will approximate 1951, and may be said to be a very good building year, with substantial structural steel tonnage produced.

New trend

A definite trend in the production of structural steel for industrial buildings has gone to the use of tapered girders for roof support. These girders are made of three plates, one web and two flange plates welded together and the roof line can be varied by changing the slope on each of the girders, thus eliminating the necessity of wood framing to provide for the slope of gutters.

Another definite trend has developed where trusses are used to split wide flange beams into two tee sections, one for the top chord and one for the bottom chord, with all interior members welded.

An engineer may use a 14-in. wide flange beam and place 8 in. of the beam for the top chord and 6 in. for the bottom chord, or split them at any point he desires to obtain the necessary strength for the compression member as compared with the tension member. This construction is very economical, since the depth of the tees provides sufficient space for welding the interior members without the use of gusset plates.

Change of source

In the past few years there has been a considerable change in sources of raw materials for Western consumers. Only a few years ago almost all of our raw materials came from the East; now a fabricator obtains almost all of his bar size angles and bars from Pacific Coast mills.

In addition, there is an increasing capacity for rolling structural angles, universal mill plates, tank plates, and structural I-beams and channels.

High-tensile bolts with hardened washers are coming into use very fast in place of rivets. It has been found that, even on railroad bridges that have severe impact vibration, a bolt of this type will hold the members equal to or better than rivets.

Reason for this is that when these bolts are tightened to a predetermined torque, the members held together are pressed so tightly that the friction does not permit of slippage. In other words, with riveted construction, the bearing value of the rivet was always a basic consideration; with this type of bolt, the bearing value is not considered at all.

GRAY IRON FOUNDRIES—

Casting production drops while industry heads for higher mechanization, scientific operation

ESTIMATE FOR 1952 production of gray iron castings is about 15% under the 1951 figure, on a national basis.

Based on current trends, the industry is tending toward a higher degree of mechanization and more scientific plant operation. Foremost in the parade of new equipment is sand handling, pouring systems, and cupola chargers.

While the greatest improvements in mechanization are in production shops, many small semi-production and jobbing foundries are introducing labor saving machines. Perhaps the greatest innovation, as far as fundamental processes are concerned, is the basic cupola. Although promising in the production of certain types of castings, it is still in the experimental stage.

Outlook for raw materials and supplies has improved materially within the last year, and barring any step-up in the defense effort, they should be adequate. Generally, the purchase of foreign pig iron as a substitute for domestic sources is on the decline and should continue that way. There are indications that iron and steel scrap may be tight during the winter months.

Most important product development is ductile iron, which promises to open new markets for gray iron. Possessing greater tensile strength, nodular iron is expected to replace some competitive materials where strength and ductility are important design factors.

Shell molding, a new process whereby molds for castings are pressed out of hot plastic, is also expected to improve quality of castings. Economies in the production of castings through the use of shell molding can be realized by virtue of the elimination of some rough machining operations. These, and stepped-up merchandising methods, are expected to increase the consumption of gray iron.

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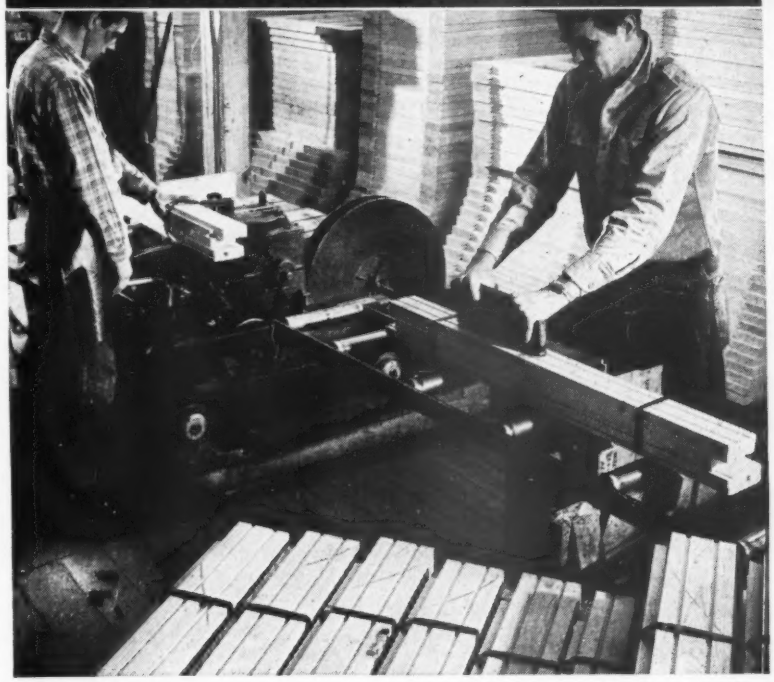

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ELECTROPLATING—

Nickel electroplating becomes even thinner as the industry is forced to curtail its current use

NICKEL is one of the most important factors in today's electroplating industry, and much electroplating activity is centered around its availability.

Since nickel is defined as a strategic metal for defense purposes, and since it is being alloyed with other metals for producing items of military necessity, there is less of it available for use by the electroplating industry. With the industry forced to curtail use of nickel, thinner deposits of this metal are plated, and substitutes are being used.

On Sept. 3, last, NPA allowed firms to plate items with a .00003 in. flash of nickel as undercoat to chromium plating, and that increase in allowable nickel was reflected in sales during the third quarter of this year, which exhibited a slight increase.

Platers are doing an increasing percentage of defense work. Sales have been generally down, due to current restrictions, but prospects for the last quarter of 1952 are good, for Western platers.

More important than processes is the new equipment coming into use by the electroplating industry. Gradually, the industry is turning toward more and more automatic conveyor equipment. This is stimulated by two factors: one, certain large government orders for shell cases, etc.; and two, the high cost of labor itself.

Changes in supplies used are the result of shortages and the changeover to a partial defense economy. Less nickel is being plated and more copper. There is more potassium cyanide being used and more cadmium and zinc plating being done, particularly zinc. Other than nickel, most metals and chemicals used in this industry are in fair supply.

In a survey recently taken of the Western electroplating industry, the following information was developed:

Out of 187 firms queried, 18 answered (9.6%) indicating that they have 360 employees currently, have room for 933 employees, they use 78,347 gallons of plating solution, 145,000 amps (6-12-v. gen.), these firms take up 125,698 sq. ft. floor space, and use 10,565 gallons of cadmium and 11,920 copper.

In Southern California alone, 17 out of 159 firms (10.7%) responded, indicating that 348 persons were currently employed, with room for 732, 68,565 gallons of plating solution were used, amperage was 146,400 (6-12-v. gen.), these firms take up a total of 136,150 sq. ft. floor space, and use 15,348 cadmium and 10,250 copper.

PRESSED METALS—

New type presses and supplies are contributing to rapid expansion of industry in the West

TWO BASIC reasons contribute to the constantly increasing expansion of the pressed metal fabricating industry in the West: (1) demands of the aircraft industry, and (2) demands for metal stampings and other pressed metal fabricated items by the manufacturers of consumer goods.

Since a large segment of the industry on the West Coast is primarily a supplier to the aircraft industry, trends and production methods are quite different in many respects to the trends in other parts of the country where demands are of a different nature.

In the pressed metal industry, where 90% of the work or more is done cold, there has been a very definite trend to larger presses. This has enabled firms to make a part in one piece rather than taking a number of individual stampings and working them together into an assembly through welding and other fastening means.

A great number of large hydraulic presses are now being built. Some of these are used in large-part applications, as mentioned, but the greater number find their application in deep draw work and cold extrusion.

A number of new types of supplies have been introduced, but the one that is probably of most interest is the application of forms of wax in drawing compounds. S. C. Johnson & Son, Inc., has introduced these products to the metalworking industry.

Elimination of basing points in steel has radically changed the steel supplier picture, but it is interesting to note the number of companies that have stuck with their old sources of supply even though it might increase transportation costs to them.

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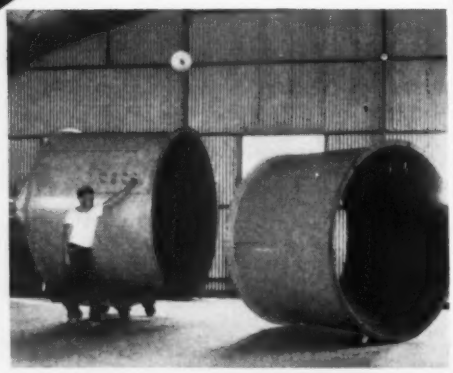

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OIL REFINERY PRODUCTION—

Petroleum Administration sees increases in refining for the 11 Western States by Jan. 1955

FIGURES in December on a refinery survey made by Petroleum Administration for Defense last fall, forecast an increase in refining capacity in the eleven Western States of 45,500 barrels a day by January 1, 1955. Detailed breakdown is as follows for District 4 (Utah, Idaho, Montana, Colorado, Wyoming) and District 5 (Washington, Oregon, California, Nevada, Arizona) for January 1, 1953, as compared with January 1, 1955.

Rated crude capacity. Dist. 4: (1953) 255,765; (1955) 257,765. Dist. 5: (1953) 1,219,100; (1955) 1,262,600.

Catalytic cracking capacity. (Breaking down into component elements in the presence of a catalyst into usable output) Dist. 4: (1953) 73,694; (1955) 85,594. Dist 5: (1953) 188,150; (1955) 262,150.

Catalytic reforming capacity. (Transforming elements into gasoline, chemicals and solvents in the presence of a catalyst) Dist. 4: (1955) 650; Dist. 5: (1953) 24,300; (1955) 53,900.

Recovery of Propylene. Dist. 4: (1953) 2,887; (1955) 3,142. Dist. 5: (1953) 8,077; (1955) 10,787.

Recovery of Butylenes. Dist. 4: (1953) 4,017; (1955) 4,572. Dist. 5: (1953) 14,252; (1955) 16,947.

Recovery of Isobutane. Dist. 4: (1953) 3,696; (1955) 4,221. Dist. 5: (1953) 10,211; (1955) 14,344.

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THIS 54-INCH diameter spherical vessel was designed by the National Supply Co. to hold liquid nitrogen for rocket propelled aircraft. It operates at pressures of 5,500 lb. per sq. in., and —340 deg. F.

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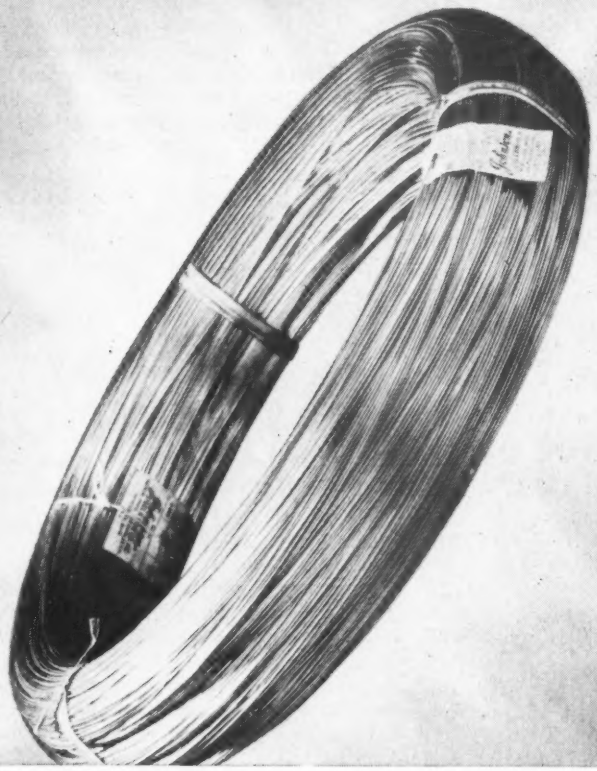

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LUMBER—

Western lumbermen are striving to reduce costs for the use of low value material

FOR EVERY ACRE of commercial forest land in this country—old growth, second growth, freshly logged, burned or restocking—$20 is invested somewhere in plant and facilities which require wood to run on. Authority for this is Col. W. B. Greeley, for many years pilot of the West Coast Lumbermen's Association and a nation-wide authority on lumber.

Use of low value material

Consequently, the search for wood to provide lumber, plywood, hardboard, pulp, paper and other products calls into play such resourcefulness and ingenuity in devising equipment for moving large quantities of low-value material out of the woods economically enough to permit its utilization.

One of these means is the greater use of small portable sawmills to effect greater salvage from logged-off areas. The use of lower grade lumber for construction purposes has provided outlets for smaller logs which these portable mills can handle efficiently.

Another incentive for the portable mills is the trend in the pine region toward lighter cutting so timber will not over-mature and fall prey to beetles. This newer method of logging is particularly suited to relatively light stands of ponderosa pine.

Demand for chips

Pressing demand for wood chips for making pulp, paper and hardboard is also serving to clean up timber which cannot be effectively used otherwise. Col. Greeley expects to see a portable barker and chipper as the final step in sweeping up raw material.

Half the wood supply for the 11 kraft mills in Oregon and Washington comes from wood chips made at over 100 sawmills and plywood plants. Formerly whole logs were brought to the kraft mills to be converted into chips there. It is estimated that 400,000,000 tons of wood for pulp now comes from leftovers, and by 1954, at the present rate of installation of chippers, the total of kraft chips from salvage sources will equal 700,000,000 tons a year. This will be equivalent to three-fourths of the pulp industry's wood requirements in the West.

Longest haul by rail for woodchips is from Swisshome, Oregon, to Longview, Washington, just over 200 miles. Longest practical truck haul is said to be 70 miles, but some truckers are beating that figure. A careful analysis of materials handling methods and practices was published in the August 1952 issue of *Western Industry*.

In the mills, the trend toward greater mechanization continues. Some examples of recent developments are:

Use of air-operated dogs on the log carriage. One machinery manufacturer specializing in this type of equipment sold 37 sets last year.

Power-operated log deck equipment which turns the log over so the opposite side can be sawed.

Pre-set edgers, which save much time as they are already set when the log reaches them. These are being introduced on an experimental basis.

Output in redwood and Douglas fir was slightly above 1951, while Western pine and associated species fell slightly below. Slight increases are expected in 1953, because of larger housing programs.

A continuing capacity for kiln-dried redwood is reported. Two relatively new products show interesting market possibilities. They are vertical-grain redwood plywood produced from sliced veneer and electronically glued products, both edge glued and end glued.

Further proof of the rise of hardboard is the fact that the Hardboard Association has been formed by six hardboard manufacturers.

PLYWOOD—

Ten new mills help production reach new heights—New market sought to handle increased output

DOUGLAS FIR plywood output reached an all-time high of around 2.9 billion feet in 1952, compared to 2.85 billion feet in 1951 and 1.875 billion feet back in 1948. This brought the total number of mills up to 83, of which 40 are in Oregon, 30 in Washington, and 13 in California. Ten of these mills were new last year, and four old plants closed down.

Increased sales promotion work is being undertaken by the Douglas Fir Plywood Association to widen the markets so as to take care of the continually increasing output. Individual manufacturers likewise are increasing their efforts.

The Association figures that 25% of the total volume of plywood goes into industrial end products, and 15% more is consumed by in-plant use. Military business dropped from 8% in 1951 to 4% in 1952.

GENERAL VIEW of a Douglas fir plywood plant shows a glue spreader on the right and an automatic press loader in center.

Roof decking sales surge

A tremendous surge of roof decking sales has resulted by FHA's acceptance of ⅜" plywood over 24" spaced rafters. Previously it was only permitted up to 16".

Structural diaphragms, chiefly for school roofs, but also in commercial buildings, are also being widely used.

Plywood shear walls have also proved advantageous in resisting earthquakes.

Plastic overlay panels and hardboard faced panels are considered to have great potentialities.

Half a dozen moisture-detecting units are now in use. These provide better quality control, and also speed up production, because the dryers can be run faster and the over-drying of panels reduced. An automatic loader for dryers also has been developed, and is in use in at least one plant.

FURNITURE—

Western manufacturers expanding their markets, but can do still more business in the West

FURNITURE manufacturers on the Pacific Coast have been able to expand their markets both East and West, improve their plant facilities, and do product research in the last year.

The West consumes far more furniture than it produces and there is a large potential market for the Western manufacturers, according to a study of the California industry by the California State Chamber of Commerce. This study calls attention to an active demand for California "styled furniture," and points out that while manufacturing costs are higher in California than production centers of the East and South, the cost differential is partly offset by high freight rates on west-bound shipments from those areas.

"California craftsmanship generally is excellent in the upholstered furniture field," the survey states, "but in the wood, or case goods line, craftsmanship is not as uniformly satisfactory, although an ever-increasing amount of fine quality items is being produced."

The survey recommends special clinics in finishing, gluing, tailoring and seasoning, continued attention to style characteristics, particularly in the middle and low price range, and development through industry promotion of California hardwoods.

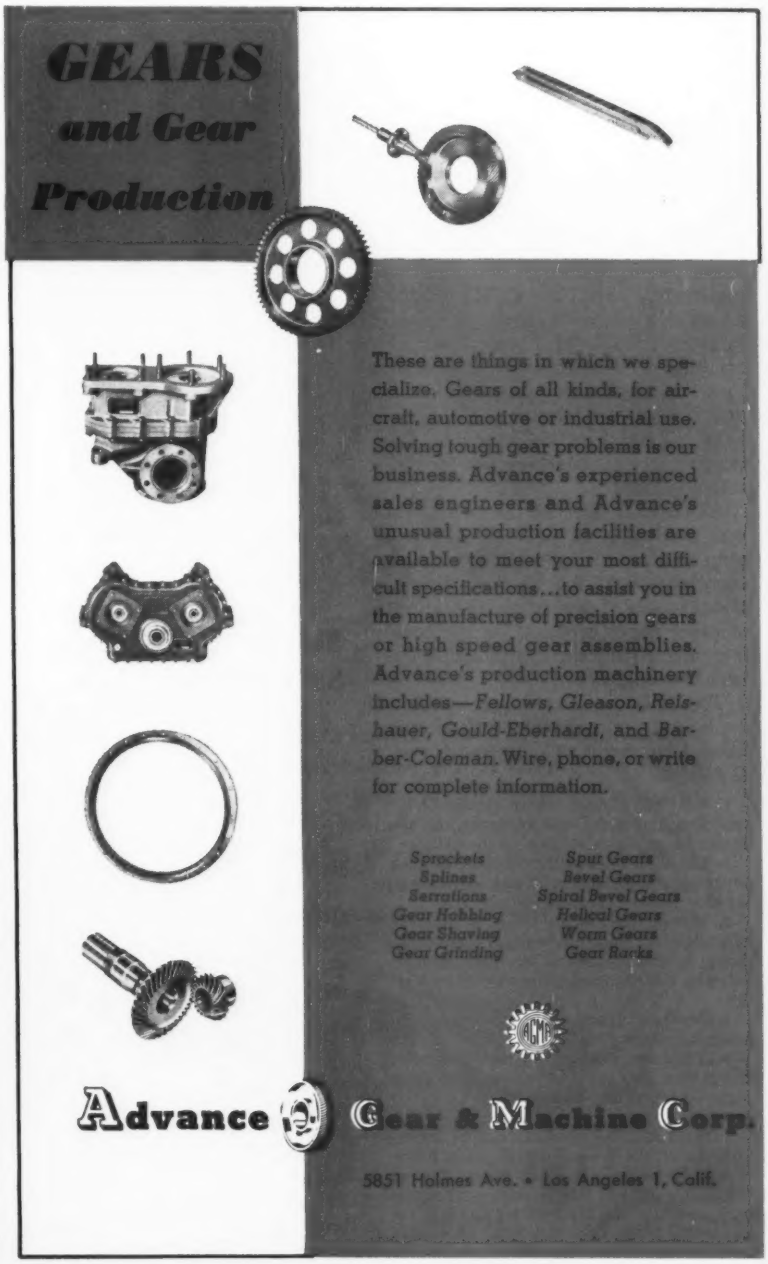
Manufacturers in Southern California have established more show rooms in Chicago and New York to get better sales distribution, and have succeeded in getting more favorable rail rates to New Mexico and West Texas markets.

In the Pacific Northwest also some improved freight rates have been obtained, and the nearby market has been made easier of access through establishment of uncrated furniture movement by truck. The Northwest's big July furniture market drew 4,062 registrants from ten states last year.

For sleep equipment, higher costs for cotton and steel are expected, making innerspring units and steel parts more expensive in 1953. Latex has dropped to more moderate price levels, and as latex producers are constantly aiming to get the price lower in the hope of getting more and more tonnage into mattresses and upholstered furniture, latex prices may be lower in 1953.

Serious attempts to relate newly designed sleep equipment to many rooms of the house and to many facets of modern living are forecast. Bedding manufacturers, realizing that lying down can be as relaxing by day as by night, see a great market ahead if they can hit on logical and appealing styles and mechanism that is not too cumbersome.

VIRTUE BROS., chrome dinette set makers, operate their own metal tubing and plating departments.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PULP AND PAPER—

Expansion of mills is continuing in the West, which already produces majority of pulp output

GENERAL EXPANSION of pulp and paper mills is continuing in the Pacific Northwest. In this area and northern California lie the largest pulpwood reserves in the nation, although keen competition in production may be expected from the South, with its fast maturing Southern Pine and hardwood stands.

Currently planned or under construction in Washington are two new kraft pulp mills for Weyerhaeuser Timber Company at Everett and Longview. Since the recent merger of Soundview Pulp and Scott Paper Company, plans for a new paper mill at the Soundview site in Everett have been announced.

Everett Pulp and Paper Company has a $3,000,000 expansion program under way, while Crown-Zellerbach is active in a multi-million dollar expansion throughout the Pacific Coast. A combined venture of Puget Sound Pulp and Timber Company and American Viscose Corporation at Bellingham will produce an estimated 300 tons per day of cellulose fibers for synthetic textiles.

As far back as 1948 the Northwest was producing 59% of all domestic pulp sold in the United States, and is currently producing 31% of the national supply of newsprint. The output of other paper products on the coast is comparatively small, although it has been growing rapidly.

The situation in the paper converting field is summed up by a California State Chamber of Commerce survey as follows:

1. Kraft and other coarse paper can be produced at greater cost advantage on the Pacific Slope than elsewhere in the nation.
2. The West's production of book and fine paper is not in balance with its consumption, though certain grades are exported.
3. Though the Pacific Coast produces a substantial amount of sanitary and tissue paper, increasing demand for these products indicates further development would be feasible.
4. Paper box board and other paper packaging industries have not expanded as rapidly as Western demand for their products; this is true also for Western-made building paper and building board, where supply is short of demand.
5. Most of these products can be manufactured on the West Coast at prices below or equal to those prevailing in the East or the South, but rail freight rates limit distribution outside the Western region, save for specialized products of high value in relation to bulk.

Consumption and production of newsprint in the West is expected to rise more than 1/3 above the present rate in the next ten years, according to a study made by Stanford Research Institute. By 1961, they say, Western users of newsprint will require 35% more than presently, as contrasted with an 18% rise in national consumption.

Unbleached kraft produced in the eleven Western States in 1951 amounted to 321,846 tons. Estimated 1952 production is about 340,000 tons. All this was produced in Washington and Oregon.

WEST COAST PULP AND PAPER
Summary Statistics
(Seattle Chamber of Commerce, Industrial Research Division)

	Wash.	Ore.	Calif.
No. of Pulp Mills	28	12	3
No. of Paper Mills	17	9	16
No. of Converters	30	19	109
Pulp production capacity, thousand lbs./24 hrs.	11,672	3,412	540
Paperboard production capacity, thousand lbs./24 hrs.	2,068	266	3,996
Paper production capacity (incl. newsprint and kraft), thousand lbs./24 hrs.	4,421	2,365	170

SHINGLES AND SHAKES—

Style trends give pre-stained shakes a big lift and production in Northwest mills zooms

STYLE TRENDS in home building have given the pre-stained cedar shake for exterior side walls a big lift, with the result that output of grooved shakes has zoomed from 328,431 squares in 1949 to around 1,000,000 squares in 1952. The Stained Shingle and Shake Association estimates that at least 10% of all non-farm residential starts in 1952 had cedar shake side walls.

The product is a remanufactured shingle known in the trade as a reprocessed shake, with grooved sides and retrimmed edges and butts. Since the formation of the Association, the formulas and mechanics of staining have been revamped with the cooperation of the largest paint manufacturers in the country, timber selection has tightened up, greater care is being used in the drying, and every plant has at least one employee assigned to the duty of checking and adjusting the machines to insure good re-butting and re-joining.

Custom grooving plants and new shake machines are among the accompanying developments.

All the red cedar shingles and shakes in the country come from the Pacific Northwest and British Columbia. Mills of the Red Cedar Shingle Bureau produced 17,252 cars of 250 squares each in 1949, 20,456 cars in 1950 and 18,110 cars in 1951.

PAPER BOXES—

Western boxmakers doing somewhat better on sales than in all other parts of the country

THE PAPER BOX industry in the West is keeping pace with the large population increase. The number of plants has increased and established plants now have greater productivity. The present rate of sales compares favorably with previous periods, and the average Western boxmaker is doing somewhat better sales volume-wise than in other parts of the country.

New types of boxes are being produced, and many of these are for automatic filling. Boxes for frozen food and milk and carriers for beverages are being made in volume. Boxes for products formerly packed in the East, such as soap, are now made on the Pacific Coast.

With increased sales, the manufacturers have been able to install the latest types of equipment and to modernize their plants in many ways. Folding box manufacturers have installed new two-, three- and four-color rotary presses which are the fastest and newest available. High-speed cutting presses and gluing equipment have been installed.

Laminating equipment, with which paper board may be lined with various types of paper, has now been placed in service. Greater accuracy is being developed, especially on boxes for automatic assembling and filling. Better printing and design is being offered.

In the set-up box industry new semi-automatic and full-automatic wrapping machines have been installed to cover the boxes and lids with an outer wrap. Newly designed equipment for stapling boxes, using thermoplastic heat sealing stay tape rather than glued tape, is in service in several plants.

Many paper box plants in the West are kept aware of advances being made

in the industry through their membership in the Folding Paper Box Association of America (folding) and National Paper Box Manufacturers' Association (set-up). In the annual paper box competition of these associations, held on a national basis, the Western manufacturers have won many awards and produced many outstanding packages.

CELLOPHANE—

Western consumption so great that feasibility of factory in the area is under survey

WESTERN consumption of cellophane is estimated at 30,000 tons per year. Since the closest producing plant is in Clinton, Iowa, freight alone costs Western cellophane consumers at least $17,460,000 per year.

With this in mind, there is currently a study being conducted in the Northwest area toward determining feasibility of establishing a producing plant in the West. A survey by the Seattle Chamber of Commerce reports the following situation:

Western needs are somewhat different from those of Eastern consumers in this wise: (1) there is little or no tobacco-processing requiring packaging in the West; (2) the manufacture of converted paper products in the West is not as active or extensive as in the East; and (3) the Western frozen food and consumer packaged food industry is far more extensive than in other parts of the nation.

While it is impossible to accurately weigh the frozen and dried food pack in terms of cellophane consumed, an unweighted average shows Western production equaling 46.1% of the total United States pack.

Assuming the amount of cellophane consumed by the industry is regionally constant in proportion to the quantity of food processed, the amount of cellophane consumed in packaging frozen and dried foods in the West may be conservatively estimated as 46% of the cellophane consumed for similar usage nationally.

Estimates of the Western market for cellophane used in food packaging are:

	Tons per year	Tons per day
Low estimate	19,900	55
Median estimate	28,231	78
High estimate	36,561	100

The median estimate exceeds even the total estimated consumption of cellophane by the entire United States tobacco industry, and would probably represent the largest single-use regional market in the nation.

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CHEMICALS—

Expansion projects in West under certificates of necessity total over $210 million in 2 yrs.

CHEMICAL INDUSTRY expansion projects authorized in the West in the last two years under DPA rapid amortization certificates total $210,518,772. This is broken down as follows:

California	$109,693,514
Oregon	2,348,096
Washington	24,490,830
Montana	10,332,317
Idaho	20,802,370
Wyoming	20,712,250
Colorado	2,799,798
New Mexico	2,154,499
Arizona	66,500
Utah	14,578,258
Nevada	2,540,340

Carbide & Carbon Chemical Company's $36,000,000 project at Torrance, Calif., is the largest in the list, and constitutes one of the first really "big" petro-chemical operations in the West. Expected annual output is 50,000,000 to 60,000,000 lbs. of polyethylene and 5,000,000 to 10,000,000 lbs. of ethylene glycol. Raw materials, in the form of ethylene-containing gases, will come from the nearby General Petroleum Corporation refinery. The plant will be a source of supply for the Southern California plastics industry.

Among other new Western projects are:

A $5,000,000 plant in Salt Lake City jointly owned by Stauffer Chemical Company, Kennecott Copper Corporation and American Smelting & Refining Co. to produce superphosphate.

Shell Chemical Company ammonia plant at Ventura, Calif., to come on stream this year. Brea Chemical Co., subsidiary of Union Oil Company, $13,000,000 plant to make ammonia from natural gas from nearby wells.

Filtrol Corporation, $5,000,000 plant in Southern California to treat refinery waste effluent, to recover alumina for manufacture of petroleum catalysts. The treating acid is neutralized with ammonia, producing ammonium sulfate for fertilizer.

Howe Sound Mining Co., $2,500,000 cobalt refinery at Salt Lake City. (This plant will increase world cobalt production by 40%.)

Standard Oil Company, 13,000,000 gal. annual capacity benzene plant. Shell Chemical Co., petro-benzene plant.

Two phenol plants: Monsanto Chemical Co. at Avon, Calif. (with a 250-ton sulfuric acid plant at the same site to be jointly owned by Monsanto and Tidewater-Associated Oil Co.); Standard Oil Company, $4,000,000 cumene-phenol plant at Richmond, Calif. Output from these two phenol plants to total 65,000,000 lbs. a year, enough for the entire Western demand.

TRACTOR OPERATOR scooping up ammonium sulphate crystalline fertilizer at the Shell Oil Co. plant at Pittsburg, Calif.

Great Lakes Carbon Corp., diatomaceous earth filler aids and fillers plant at Lompoc, Calif.

General Chemical Co., $2,500,000 15,000-ton per year aluminum fluoride plant in San Francisco Bay area.

National Chlorophyll and Chemical Co., $1,000,000 plant at Lamar, Colorado, to produce 4,000 tons of chlorophyll monthly from alfalfa.

Polyester resins are now being produced on the West Coast for the first time, by Chemical Process Company, Redwood City, Calif.

Total shipments in 1950 of sulfuric acid, including interplant transfers, from plants in Arizona, California, Colorado, Montana, Utah and Washington were reported by the Census Bureau as 794,276 tons compared with 717,287 tons in 1947. Production of new acid for 1950 was 829,317 tons in 1950; 709,849 tons in 1949.

SALT INDUSTRY—

Production and sales

(Source: Leslie Salt Co. and U. S. Bureau of Mines)

CALIFORNIA SALT PRODUCTION
(Estimated)
(in thousands of tons)
Calendar Years

1950	1951	1952
915	1,180	1,064

CONSUMPTION OF CALIFORNIA SALT PRODUCTION BY MAJOR CONSUMERS
Five Western States
(1950 = 100)

	1950	1951	1952
Household	100	103	107
Food Processing	100	104	108
Agricultural	100	105	109
Mfg. and Industrial	100	107	116
Electro-chemical	100	130	120
Miscellaneous	100	105	110

CONSUMPTION OF CALIFORNIA SALT PRODUCTION
(in thousands of tons)

	1950	1951	1952
Arizona	12	10	8
California	462	545	550
Nevada	90	145	130
Oregon	60	99	80
Washington	217	251	250
	841	1,050	1,018

ALCOHOL—

Five plants in the West produce ethyl alcohol for chemicals, pharmaceuticals, etc.

IN the West, there are five plants producing ethyl alcohol for industrial use in manufacture of chemicals, protective coatings, flavoring extracts, pharmaceuticals, cosmetics, lotions, etc. Here are the production figures, latest data available, from the Alcohol and Tobacco Tax Division of the U. S. Treasury Department's Bureau of Internal Revenue:

Domestic Undenatured Alcohol, in proof gallons, January through September, 1952

California	3,072,256
Oregon	62,776
Utah	8,695
Washington	4,406,608

LIME—

Carbide expansion alone in the Pacific Northwest ups requirements to 100,000 tons yearly

PACIFIC NORTHWEST requirements for lime for 1952 are figured by the Raw Materials Survey, Portland, as follows:

Total of 82,000 tons, distributed as follows: pulp and paper, 32,000 tons; calcium carbide, 25,000 tons; building materials, 14,000 tons; adhesives, 1,500 tons; steel, 7,000 tons; agriculture, 500 tons.

Carbide expansion alone is reported as boosting annual requirements to 100,000 tons by 1953, with additional lime capacity much needed.

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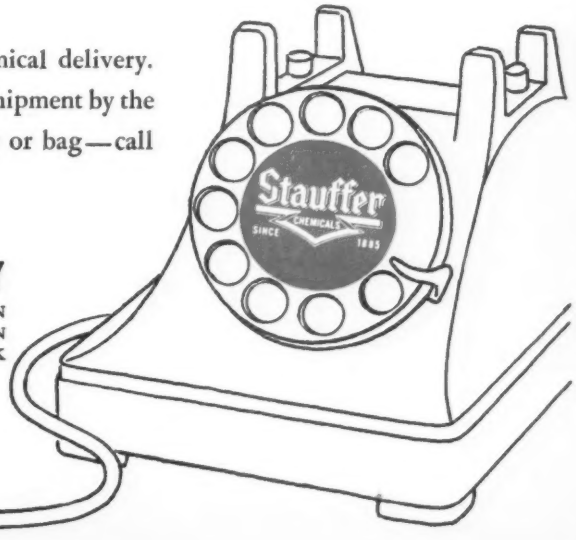

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FERTILIZER—

Market constantly expands — Mixing plants are installing highly automatic bagging equipment

FERTILIZERS used in California during 1940 amounted to 216,735 tons. Ten years later, in 1951, California used 731,400 tons, an increase of 237%.

Indications for 1953 are that the principal materials will be in somewhat better supply than during the past year, with the exception of treble superphosphate, ammonium nitrate, and, during the first four months of 1953, sulphate of ammonia.

Total marketed production of phosphate rock in the Western states rose from 783,209 long tons in 1950 to 1,178,481 tons in 1951. Phosphate rock was produced and sold in all four states of the Western field in 1951—Idaho, Montana, Utah and Wyoming. Idaho led in sales, with Montana second and Wyoming third.

Reports have it that a new ammonia facility will be built in the state of Washington by Allied Chemical and Dye Corp. This projected plant is expected to produce around 200,000 tons of nitraphosphate.

With respect to requirements, the U. S. Dept. of Agriculture estimates that the 1951 requirements were about 212,000 tons of nitrogen compared to the 110,800 tons produced on the West Coast. However, some nitrogenous fertilizers have been imported regularly from Canada for use in this area.

PHOSPHATE ROCK PRODUCTION
(U. S. Bureau of Mines)

	Long tons	
1951	Phosphate rock	P_2O_5 content
Idaho, Montana and Wyoming	441,634	129,801
1952		
Idaho	170,549	52,024
Montana, Wyoming and Utah	230,557	68,003

USDA also estimates that the 1955 requirements for nitrogen for the 11 Western states will be approximately 308,000 tons. It is believed that such estimated requirements can be met by the overall facilities which will be constructed by 1955.

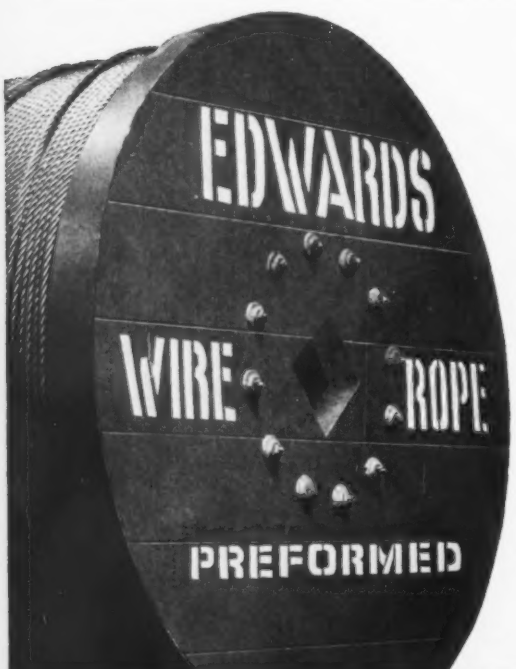
In general, no significant changes have taken place in production methods and equipment, although certainly some of the plants in the West have been modernized to varying degrees.

One of the most significant developments in processing which has taken place in the fertilizer industry concerns the use of nitric acid in the acidulation of rock phosphate. At the present time, about six companies have obtained certificates of necessity for constructing such plants, but these are Eastern plants.

There have been rather recent startling production method changes which involved the new granular type fertilizer. There are several methods of production and practically any standard plant food mixture can be incorporated. The most common forms of granulated products to date are ammonium phosphate sulphate (16-20-0) and ammonium phosphate (11-48-0). These products are generally more uniform in size than is the case with standard mixed fertilizers, and are enjoying farmer acceptance.

Most new equipment going into fertilizer mixing plants, particularly the larger ones, is highly automatic and in many cases contains complicated electronic control devices. The bagging equipment, particularly, is following this trend, having the tendency to eliminate short or overweight packages which result from human error. There are no changes or trends in types of supplies or sources of raw materials that are evident at this time.

Quality of commercial fertilizer materials is constantly being improved. This is borne out by reports of numerous universities throughout the country in connection with their findings covering the use of fertilizer materials.



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CHLORINE—

ESTIMATE of chlorine gas production in the eleven Western states during 1952, according to the Chlorine Institute, is 890 tons of gas per 24-hour day in a seven-day week. The previous year's production estimate by the same source was 600 tons of gas in the same period. Difference in 1952, of 290 tons per day is due mostly to expansion of Hooker Electrochemical plant at Tacoma.

PAINT—

One-third of Western market is using latex for interior work, exterior finishes being tested

PERHAPS AS MUCH as one-third of the present Western paint market is now taken up by the new latex base paints for interior work, and outside latex base finishes are being field tested in selected areas in California by at least one major producer.

Informed sources in the industry herald this innovation with the same interest and respect they paid to lacquer when it was considered a revolutionary product a few years ago. The latex type paints have become popular because they are easy to apply, can be thinned with water, the surfaces are easily touched up.

A recent survey by the California State Chamber of Commerce reveals the following facts about the Western paint industry:

1. Western paint producers sell considerably more of their product through company-owned wholesale retail outlets than is true for the rest of the nation.

2. The market for paint products is increasing.

3. Higher production costs of Western manufacturers are protected by still higher rail charges on competitive Eastern items.

4. With the continued development of more locally produced oils, pigments and alkyd resins at prices favorable to the West Coast industry, Western producers could expand their markets into some regions dominated by Eastern manufacturers.

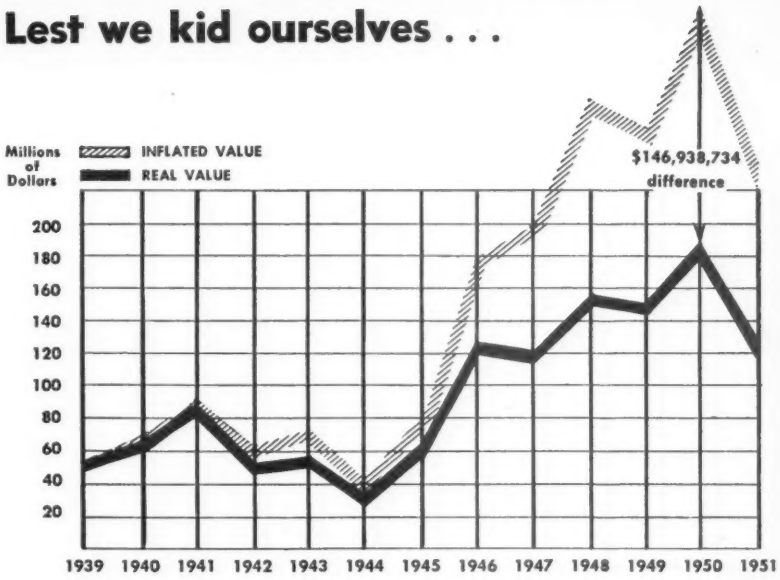
STEEL PIPE—

PRODUCTION of steel pipe in seven Western states was 724,000 tons in 1951, compared to not more than 25,000 tons a year before 1942. Most of the steel pipe manufactured in this area is produced by electric weld processes, making pipe that is used mainly to tie the country together in a vast network of oil and gas lines, similar to the railroad system.

In the Western states there are about 450 warehouses handling merchant and line pipe on a jobber basis, accounting for approximately 18.69% of the total tonnage handled through warehouses in the United States.

Colorado Fuel and Iron Corp. is building a seamless mill at Minnequa, Colorado, with a capacity of approximately 15,000 tons per month. It should go into production late this year.

Lest we kid ourselves . . .



. . . the REAL Worth of building versus INFLATED dollars.
1939 dollar = $1.00 **1951 dollar = $0.54**

Chart shows progress of construction in the Pacific Northwest, as prepared by Equitable Savings & Loan Association, Portland.

LEAD—

DOMESTIC mine production of recoverable lead declined to 388,164 tons in 1951, 10% below the 1950 total and the lowest annual national output since 1947.

This decrease was accounted for partly by the shutdown of most of the lead mines, mills, and smelters in the Western states by a strike from August 23 to September 6, and partly by a depletion of ore bodies.

Mine Production of Recoverable Lead

U. S. Bureau of Mines, Mineral Market Report

	1950	1951
Alaska	149	21
Arizona	26,383	17,394
California	15,831	13,967
Colorado	27,007	30,336
Idaho	100,025	76,713
Montana	19,617	21,302
Nevada	9,408	7,148
New Mexico	4,150	5,846
Oregon	17	2
Utah	44,753	50,451
Washington	10,334	8,002
Wyoming	.....	.....
Total	257,674	231,182

RICE—

LAST YEAR and this year should be all-time record years in the California rice industry on many fronts. More rice is being produced than ever before in this state, the yield per acre is as high as ever before, and the price is up to four times the pre-war level.

Last year (Oct. 1951-Sept. 1952) saw over 10,015,000 bags of rough rice put through the mills in California, and producing 7,333,000 bags of the milled product. Previous year, the rough rice crop ran 7,369,000 bags, and milled production resulted as 5,-170,000 bags. This includes all types of rice.

COTTON SEED—

(From Bureau of Agricultural Economics, U. S. Dept. of Agriculture)

	Ariz.	Calif.	Total West
Crushed or Used (tons of 2,000 lbs.)			
1951	208,878	447,692	656,570
1950	187,050	459,869	646,919
1949	133,988	376,556	510,544
Crude Oil (thousands of lbs.)			
1951	71,746	148,701	220,447
1950	61,008	156,389	217,397
1949	42,134	127,272	169,406
Cake and Meal (tons of 2,000 lbs.)			
1951	89,449	204,102	293,551
1950	80,195	212,119	292,314
1949	56,330	177,626	233,956
Hulls (tons of 2,000 lbs.)			
1951	50,681	92,601	143,282
1950	46,951	91,867	138,818
1949	34,705	73,180	107,885
Linters (in running bales)			
1951	66,064	177,398	243,462
1950	64,837	174,456	239,293
1949	44,686	130,809	175,495

FROZEN FOODS—

Year-around packing advantage because of climatic conditions puts California into the lead

AN OUTSTANDING trend in the frozen foods industry is the rise of California in importance because its climate makes it the only state where year-around packing is possible. In 1951, California packed 24% of all frozen vegetables in the country and 17% of all fruits and berries.

Several crops a year are possible with most items, and the growing areas are spread over a large part of the state. Consequently, unfavorable weather, insect pests or plant diseases usually are of only temporary and local effect. Thus the danger of losing a crop which confronts all other areas is eliminated. An example of the long packing seasons is broccoli, packed from September until May.

Perhaps the most remarkable feature is that California has become a big frozen strawberry packing state, accounting for 28% of the national output last year. The pack of this item jumped from 40,000,000 lbs. in 1951 to around 58,000,000 lbs. in 1952.

Western packs bigger

Records for 1951, which are the latest figures obtainable, show that Washington and Oregon together packed a slightly larger tonnage of both fruits and vegetables, but over half the Northwest output consisted of peas. In California, lima beans are the leading vegetable item, with spinach a close second and broccoli and Brussels sprouts following.

In 1951, the Northwest was still ahead of California in strawberry output, and its next ranking packs were raspberries and blackberries, while in California freestone peaches, apricots and boysenberries were the runners-up.

Total Western pack figures for 1951 are as follows, in thousands of pounds:

	California	North-west	Total West
Fruits and berries	84,254	96,192	178,446
Vegetables	200,086	220,945	421,031
Total pack	284,340	317,137	599,477

Growing and packing have gotten down to very systematic operations in the last few years, with seed companies developing varieties most suitable for freezing, growers using improved harvesting practices and cutting down time lag between field and processing plant, and the packers mechanizing their operations so that all free flowing products are on a fully automatic basis. One of the new developments is use of walnut-sizing machines for sizing Brussels sprouts, eliminating hand sorting.

Definite trend toward smaller sizes in retail packages continues, and in the institutional trade demand for 10-lb. sizes for smaller institutions is increasing. Greater use is being made of both cans and metal end containers.

Freezers help

The sale of home freezer cabinets obviously widens the market for frozen foods. National Electrical Manufacturers' Association statistics show 34,272 electric farm and home freezers sold in the eleven Western states in the first half of 1951 while 60,689 were sold in the entire year of 1950.

U. S. D. A. survey of cold storage warehouses shows 28.7 million cubic feet of sharp freezer space in the eleven Western states in 1949 compared with 22.4 in 1947. A large part of the freezing is done by warehouses rather than by packers.

Sales of frozen orange concentrates passed those of fresh oranges for the first time in August 1951, but California lags far behind Florida in both this item and grapefruit. It has a monopoly on lemons, however. Sunkist Growers report the following figures from California and Arizona:

	1950-51	1951-52
	Gallons	
Frozen orange juice concentrate	4,180,000	2,000,000
Frozen lemonade	3,437,000	5,700,000
Canned single strength orange juice	5,400,000	4,050,000
Canned single strength lemon juice—frozen	455,000	775,000
Canned single strength lemon juice—non-frozen	1,263,000	1,700,000

Lower production of frozen orange juice concentrate for 1952 was due to scarcity of fruit available for this purpose. Average retail price for a 6-oz. can of frozen orange juice concentrate declined from 21¢ in 1951 to 16¢ in 1952. The latter is not a break-even price for California growers, who must receive at least 21¢ at retail to come out even. Consequently, Sunkist is pushing more than before the consumption of oranges in fresh form, because of better return.

Lemon juice products, however, have shown some increase in price. Frozen lemonade, for example, averaged 16½¢ for a 6-oz. can in 1951, while in 1952 it averaged 17¢.

The Pacific Coast is the second largest fish freezing region in the country, packing from 9% to 13% of the national total. In 1951, the pack was 30,146,000 lbs. New England is the big area, accounting for about half the nation's output.

MEAT PACKING—

Increasing Western population forces packers to go farther eastward to acquire supplies

WESTERNERS eat meat faster than they can grow it, and the chasm is ever widening between the consumers and the producers.

One result of this is that Western producers have had to go farther and farther East to get enough raw material to supply demand.

To get cattle and calves, for example, in 1925-27, the Western packer-buyers went east to an average distance that would determine a line running through western Montana, western Wyoming, western Colorado, New Mexico, and the western tip of Texas. In 1955, estimates have it that the Western packer-buyers will have to travel into eastern Montana, eastern Wyoming, eastern Colorado, and the panhandle and eastern Texas.

To get sheep and lambs, the line runs (1925-27) right through the vertical centers of the Pacific Coast states. Projected 1955 line runs through central Montana, western Wyoming, western Colorado, central New Mexico, and the western tip of Texas.

For hogs, the Western packer-buyers had to go (1925-27), to western North and South Dakota, and due south through central Texas. For 1955, the projected line runs almost coincidental with the North-South Dakota boundary lines with Minnesota and Iowa, then continuing south through eastern Nebraska, Arkansas, Oklahoma, and east Texas.

One trend in the Western meat packing industry that is easily identified is the swing toward the Federal Inspector's stamp. At the beginning of World War II the State of California had three or four plants that were Federally inspected. Today, closer to 100 plants enjoy that privilege.

This decision—to conform to USDA regulations—is entirely voluntary with

the packers. It means a capital outlay for new equipment, and probably a plant addition to house it. But with increased population and stronger competition, more and more packers are making that decision.

LIVE WEIGHT OF LIVESTOCK SLAUGHTERED COMMERCIALLY, WESTERN STATES

from Bureau of Agricultural Economics statistics (in thousands of pounds)

	1949	1951
Cattle	2,850,866	2,915,191
Calves	215,449	123,384
Sheep and Lambs	249,322	264,898
Hogs	1,055,652	1,231,036

CANDY—

New outlet opens up in cellophane bags for supermarkets

BIGGEST news in the candy business, apparently, is that a brand new market has opened up for cellophane bagged candy in today's modern Supermarkets.

Confectionery and Competitive Chocolate Products: Dollar Sales of Manufacturer-Wholesalers*

Area	9 mos. 1952 in $1,000 units	% change from 9 mos. 1951
Mountain Ariz., Colo., Ida., N. Mex., & Utah	4,136	—4
Pacific	35,171	+7
Calif.	29,746	+8
Wash. and Ore.	5,425	+2
Total	39,307	

	1951—12 mos. in $1,000 units	1950—12 mos. in $1,000 units
Mountain Ariz., Colo., Ida., N. Mex. & Utah	6,777	6,765
Pacific	49,101	45,095
Calif.	40,660	36,754
Wash. and Ore.	8,441	8,341
Total	55,878	51,860

*Does not include chocolate manufacturers' sales.

CITRUS PACKING—

Marked trend developing toward cartons instead of wood boxes—Fresh fruit houses consolidating

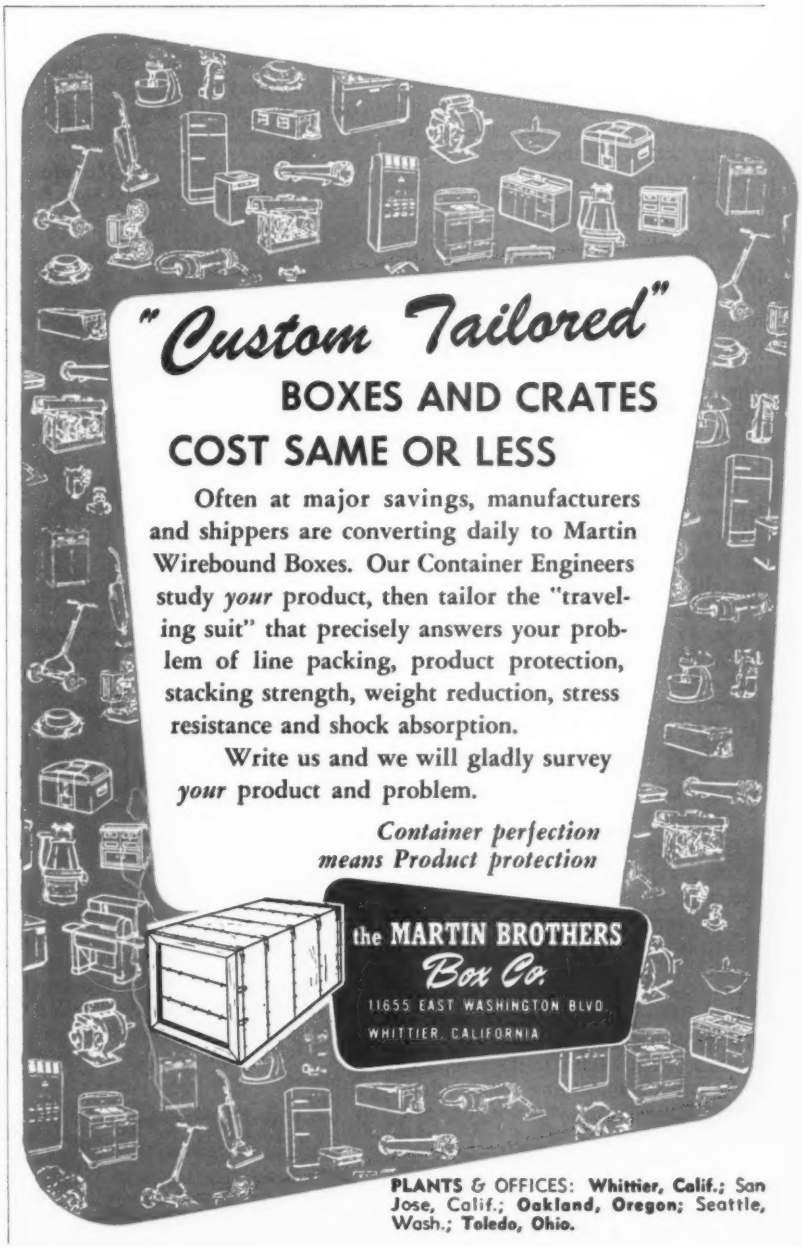
RETURNS from the California citrus industry in 1952, f.o.b. packing house or processing plant, are estimated by Sunkist Growers, the cooperative marketing association which dominates the industry in the West, at from $175,000,000 to $200,000,000. National retail sales from all producing areas of the country for 1951 show citrus as having $714,000,000 at retail prices; canned fruits, $426,000,000; canned vegetables, $464,000,000; and all-purpose flour sales, $444,000,000.

There has been an inclination toward consolidation of fresh fruit packing houses in California and Arizona, largely to eliminate high-cost plants. Sunkist Growers had 190 member associations in 1949, while in 1952 the number had shrunk to 174.

Industry output for the 1950-51 season was 115,800 cars (56,700 valencias, 28,100 navels, 31,000 lemons).

A marked trend is developing toward packing in fiber cartons instead of the traditional wooden box. About half the lemons are now shipped in that form. Cartons are easier to fill, the board material is resilient, not abrasive, consequently, fruit can be rolled into the box with little chance of damage. The pack is level, with no crown to be built on it, and with no lid to be pressed onto the fruit. No wraps are required as the tight box protects the fruit from shrinkage.

Besides the labor saving (since individual oranges or lemons do not have to be handled and wrapped), savings of 33¢ a standard box on lemons and 15¢ on oranges for packing material, 7¢ to 14¢ for freight and 12¢ or more for refrigeration are reported. Lack of mechanical sizing equipment for lemons previously was a handicap to the new form of packing, but satisfactory sizers are now being provided.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DAIRY PRODUCTS—

West is faced with coming milk shortage, since consuming population is outrunning production

PACIFIC Slope states (Washington, Oregon, California) are in a peculiarly unenviable geographic position when it comes to this industry; these states are about at a point where they are facing a milk shortage. They can no longer feed their population on their own production.

Reasons: On the West is the Pacific Ocean, with no cows resident in it. On the South is Mexico, notorious with hoof - and - mouth disease rampant among cattle. On the East are 800 miles or so of desert, and then the mountains. And on the North is another country, Canada, with its own similar problems.

More fluid milk

Before the war California used to put around one-third of its milk production into fluid milk, two-thirds into manufactured production (i.e., butter, cheese, etc.). Today that situation is nearly exactly reversed, with two-thirds going into fluid milk and one-third into manufactured products. These states are now importing the balance of the manufactured products.

Before the war we used to export lambs, veal, sheep, etc. Today, we import 40% of the lambs, 60% of the beef, and 80% of the hogs consumed in California.

This situation comes about not only because of our unique geographic isolation, but for a few other basic reasons. Our human population is increasing much faster than our cow population, and freight rates prohibit the importing of fluid milk, for one thing.

Other crops interfere

The high price of cotton is a basic reason for the curtailment in our dairy industry expansion, too. Hay and forage crops are definitely a limiting factor; a short while ago in the West, alfalfa producing land comprising between 200,000-300,000 acres was turned into cotton production, simply because the cotton crop brought the farmer far more money. When you figure 5 tons of alfalfa to the acre, that means that something more than 1,000,000 tons of hay were not grown to feed the cows.

Since hay is so bulky and heavy, it is not economically feasible to import it in any quantity, and the farmers feed the cattle grain—at greater cost.

So, with an increasing population of people and industry, yet a so-far decreasing incentive on the part of the dairy industry to step up the cow population, the West in general is faced with a coming milk shortage.

Basic fundamental in manufactured milk products is the amount of available milk. At this writing, the per capita amount of milk is steadily decreasing, yet the total amount of milk remains practically static. Result is that the dairy industry is beginning to feel the pinch — and 1952 brought about this feeling in stronger evidence.

Since Grade A milk is most perishable, more and more of it is going into bottles for home delivery in the immediate production area. Where manufactured products can be imported, fresh milk cannot. Hence, more and more manufactured products are being imported, and the Western manufacturers are concentrating more and more on producing the more perishable products, such as cottage cheese and ice cream, leaving the less perishable products for producers in other areas to ship into the West.

Evaporated output

Figures for 1950, the latest statistics available, show production of evaporated milk for California as 312,988,000 lbs., Utah 59,958,000 lbs. and Washington 71,370,000 lbs. California is the second largest producer in the country.

Manufactured Dairy Products

(Bureau of Agric. Economics, U. S. Dept. of Agriculture)

	Mountain		Pacific	
	1949 1000 lb.	1950 1000 lb.	1949 1000 lb.	1950 1000 lb.
Butter, creamery	55,763	59,487	75,331	71,264
Cheese: Total[1]	39,815	40,757	40,184	40,914
Cottage cheese:				
Curd	8,470	9,113	62,913	69,692
Creamed	9,115	10,639	93,464	100,919
Condensed milk:				
Sweetened				
Case goods				
Unskimmed	—	—	20,626	12,581
Bulk goods				
Skimmed	2,317	1,898	12,746	11,468
Unskimmed	—	—	929	969
Unsweetened				
Bulk goods				
Skimmed	6,071	5,231	64,786	62,934
Unskimmed	1,588	4,867	20,104	20,804
Evaporated milk, unskimmed:				
Case goods				
Unskimmed	158,009	157,814	348,981	397,120
Condensed or evaporated buttermilk	1,356	1,582	332	494
Dry milk:				
Whole milk	482	1,149	7,111	7,924
Nonfat dry milk solids				
Spray process	36,370	38,534	59,537	52,312
Roller process	332	82	14,364	11,577
Total nonfat for human food	36,702	38,616	73,901	63,889
Skim milk, for animal feed	448	494	2,465	3,256
Buttermilk	687	914	961	941
Cream	—	—	—	106
Whey	7,775	7,985	17,275	20,899
Casein	351	390	4,299	4,055
Frozen products:				
Ice cream	1000 gal.	1000 gal.	1000 gal.	1000 gal.
Wholesale	14,334	14,981	44,181	45,814
Retail	2,419	2,397	7,058	7,454
Total	16,753	17,378	51,239	53,268
Sherbet, milk	405	541	2,553	3,112
Ice milk	2,217	2,379	13,550[2]	14,935[2]
Other frozen dairy products	491	854	130	220
Ice cream mix	8,675	9,108	27,151	27,320
Water ices	279	358	2,822	2,333
All other mix[3]	—	2,367	—	11,905

[1] Excluding full skim American and cottage cheese.
[2] Includes sub-standard ice cream in Oregon.
[3] Not available for 1949.

FLOUR—

Handling mill stocks pneumatically will be future method — Bulk handling in early stages

ONE outstanding development is the handling of mill stocks by the use of air rather than by screw conveyors or bucket elevators. The industry has one such mill in operation in this country (General Mills, Los Angeles), and results of experience of this mill will doubtless be reflected in design of future mill construction.

Manufacturers of milling equipment are all striving to improve and modernize their equipment, not only for better performance but to improve sanitary conditions. This effort applies to elevators handling grain as well as to mills themselves.

Other bulk trends

Another trend perhaps in the early stages yet is bulk handling of feed and flour. Some companies have specially constructed railroad cars or tanks for shipping flour, and some firms have specially constructed truck bodies for the same purpose. Others use large wooden or metal boxes to handle flour. Still others are trying cardboard containers.

It is understood that one of the larger mills in the Northwest is running tests on a fiber container that holds 2,000-24,000 lbs. of bulk flour, is completely sanitary, light weight, easily handled.

Another thing of some importance is the small package pre-mixed cake, pie, biscuit, flour. Although not especially new to the industry, the recent improvement in these products has greatly increased their use.

LATEST GOVERNMENT STATISTICS AVAILABLE

Commercial Wheat Milling Production, by States: 1951 and 1950.

Wheat Flour Production

	1951		1950
	In thousands of sacks	% of est. annual capacity*	In thousands of sacks
Washington	9,645	81.9	9,118
Oregon	5,707	84.1	4,631
California	4,896	96.1	4,607
Utah	4,087	112.3	3,811
Colorado	4,085	87.6	3,765
Montana	3,040	82.3	3,129
	31,460	544.3	29,061

*Estimated annual capacity is obtained by multiplying daily capacity by the number of work days during the year (calculated on the basis of a 5-day week with allowances for the following holidays: January 1, May 30, July 4, Labor Day, Thanksgiving Day and December 25).

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"BROWN CORD" AIR HOSE...

A molded-and-braided hose for drilling, riveting, and other general pneumatic tool service. Tube, carcass and cover are combined to assure great strength and durability, without impairing flexibility and easy handling. Oil-proof tube; rubber cover. Available in lengths up to 500 feet. Sizes ½" to 1", I. D.

"BUCKSKIN" WATER HOSE...

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"LONG LIFE," D-17. Wrapped duck construction, white tube, red Synplastic cover.

"CLOVERLEAF," D-19. Wrapped duck construction, white tube, white rubber cover.

"WESTERN," L-61. Molded-and-braided construction, black tube, black Synplastic cover.

Contact the nearest Goodall branch for complete information on the hose mentioned above; other brands in the same categories; or any other industrial rubber products you may need—acid, oil, gasoline or fire hose; conveyor, transmission or elevator belting; packings; clothing; gloves and footwear—for plant or laboratory.

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CANNED PRODUCE—

Intensive cultural practices deluge canneries with raw material, but market limits are seen

GROWERS of fruits and vegetables on the West Coast have experienced tremendous success in increasing their tonnage by more effective orchard and field practices without enlarging their acreage. The result was alarmingly demonstrated in the 1951 canning season, when an average postwar pack of 85,000,000 cases jumped to 126,000,000 cases.

Canners, who are in the middle between producer and consumer, managed to scale the 1952 California cling peach pack down from the 19,000,000 cases of 1951 to 14,000,000 cases to keep from being submerged in a sea of unsold stock. But in the tomato line they did not do so well, for the combined output of the four leading products, tomatoes, tomato juice, tomato paste and tomato catsup rose from 37,000,000 cases to almost 10,000,000 cases higher.

But, as the canning industry is always either in a state of gloom or glory, next summer may find enough of this tidal wave of tomatoes out of canners' hands so that they can breathe easier. One reason overpacks are not so disastrous as in earlier years is that the extra quarter million inhabitants gained by the West each year are prime customers for Western canneries.

Growers are not alone responsible for larger packs. Canners have been getting more cases per ton out of their raw material; for example, the cling peach yield used to be about 43 cases of canned fruit per ton of clings purchased from the grower—now it is 47 cases.

The Northwest canning industry, not yet as fully mechanized as in California and therefore not as able to operate on a close price margin, is described as apparently at an impasse so far as further growth is concerned. This is because extremely heavy increases in freight rates to Eastern points have practically erected a barrier at the Rocky Mountains, not only on most vegetables, but also to some extent on fruits, despite better quality of the Western product.

California canners also are finding that asparagus and spinach, on which they once had almost a monopoly, is becoming increasingly difficult to market against locally canned counterparts in the East and Midwest.

Need for added merchandising effort is being recognized, and 1952 saw more group and individual advertising campaigns than ever before. Cling peaches have been heavily advertised for several years, and Hawaiian pineapple packers have been at it for far longer than that, but now even pear growers and canners of California, Oregon and Washington are expected to enter on an advertising campaign this year.

Refinements in mechanized operations are continuing. One of the more important is the new Filice & Perrelli peach pitter, which operates somewhat similarly to the age-old method of twisting the fruit in two in the hands and thus leaving the peach flesh intact, instead of losing some of it as happens with various types that scoop out the pit.

In the field is a produce loader tested out by Hunt Foods, consisting of a 70-ft. conveyor belt on power-driven wheels which rolls along behind the tomato pickers so they can empty their buckets on the belt. The belt carries the fruit to a truck moving alongside a loading machine where one man can fill up field boxes directly from the truck floor, eliminating handling of field boxes on and off the ground.

CANNED FISH—

Freezer ships favored for Alaska salmon — Sardines desert Monterey — Tuna fleets suffer losses

FREEZER SHIPS are becoming increasingly important in the Alaska salmon industry. In 1952, there were 18 ships operating in Bristol Bay, the largest source of supply, as against 11 ships the year before.

They handled about 13% of the pack, bringing the fish to canneries on Puget Sound for processing, instead of having the work done in Alaska. This provides considerable saving, because cannery crews do not have to be maintained in Alaska, and the canning can be stretched out over a longer period.

Alaska salmon pack for 1952 was 3,530,079 cases, about the same as in the two preceding years, but more than 25% below the ten-year average. The Puget Sound pack was approximately as in 1950, when the out-turn was 636,000 cases, a big drop from the peak record of 911,000 cases in 1951.

Salmon canneries are trying to find a solution for the No. 1 tall size problem. The can is too deep to hold just one pound of fish and still comply with the legal maximum 10% headspace. The trend would seem to be toward use of the 14½-oz. or even 12-oz. can. Demand for a smaller institutional size, 4 lbs., is another problem, as this size has to be handpacked and there is more wastage of metal in cutting out the cans.

Sardines have deserted the old home place at Monterey, Calif., but an unprecedented anchovy run provided some 250,000 cases, and canneries still in business (some have closed up) have been canning local and imported tuna, mackerel and some sardines trucked north from Southern California.

Two big modern tuna canneries at Terminal Island and San Diego, the former completed last fall and the other to be built this year, are introducing greater mechanization into this end of the fish canning industry. Things have not been so good for the fishermen, however, as some $5,800,000-worth of tuna clippers were lost or damaged at sea. Increasing postwar competition from tuna canned in Peru and Japan is also a threat to domestic canning operations.

Northwest canners hemmed in

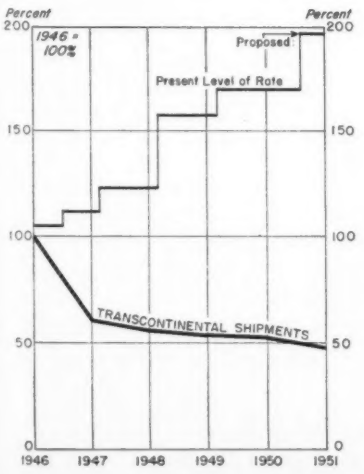

CHART is prepared by the Northwest Canners Association to show how eastern markets shrink up as the freight rates on canned goods climb higher since the war.

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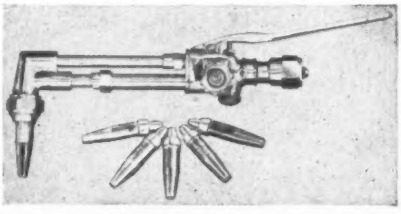

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MACHINERY—

West still far behind in output of metalworking machinery and light type of machine tools

EVEN though the West is a large user of machinery and machine tools, it is still a long way from being an important supplier of such equipment when compared with the national scene.

For example, in 1951 (latest figures available) the United States produced $629,722,000 worth of light type machine tools, particularly drilling machines, lathes, grinding and polishing machines and milling machines. Yet the West (California and Washington) produced only $3,216,000 worth of that total. These figures do not include machine tools specifically designed for home work shops, laboratories, model makers, garages, and service shops.

In the field of metalworking machinery except machine tools (including practically all metalworking machinery designed for shaping, pressing, forging or bending metal where the shaping action of such machinery is not dependent upon a cutting tool) during 1951 the U. S. as a whole shipped $214,587,000 worth, while the Western states (California, Washington, Oregon) shipped only $6,318,000 worth of that figure.

In the field of farm machines and equipment, the story is a little different. Since the West is primarily an agricultural economy, it would naturally follow that farm equipment would demand important attention. It does: figures on all machines and equipment follow on page 104.

CUTTING DIES—

ESTIMATE by the Cutting Die Institute indicates 1952 expenditure of between $300,000 and $400,000 in the eleven Western states for dies used in the manufacture of shoes and other leather products, plastics, rubber, etc.

Machine Tools: Quantity and Value of Shipments of Selected Classes of Products by Geographic Division and State, 1950.

SHIPMENTS—1950

Division, States and class of product	Value (thousands of dollars)
All Machine Tools, total	$315,743
Pacific States (California and Washington)	1,144

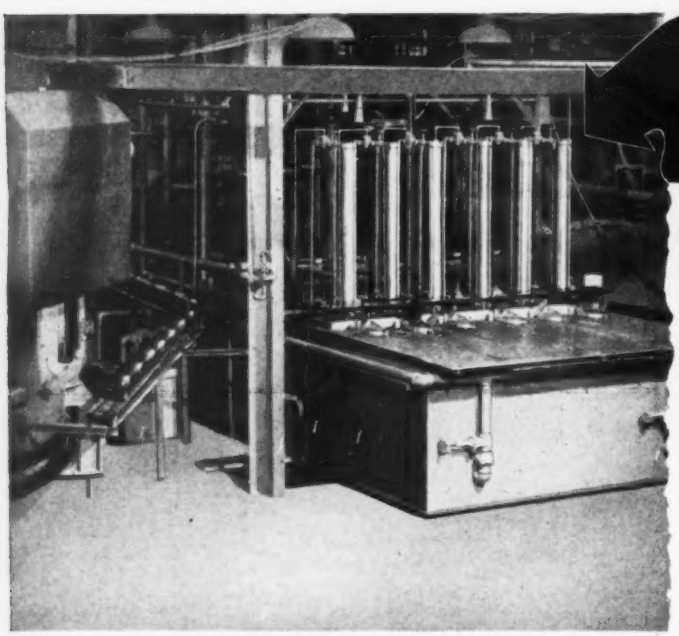
Metalworking Machinery (Except Machine Tools): Value of Shipments 1951 and 1950*

(Value figures in thousands of dollars)

Division, State, and class of product	Shipments 1951 Value f.o.b. plant	Shipments 1950 Value f.o.b. plant
Metalworking machinery, total	$214,587	$155,007
Pacific States (California, Oregon and Washington)	6,318	4,369
Bending and Forming Machines (Power), total	27,409	20,209
Pacific States (California and Washington)	1,616	—
No. of units	(289)	—

(From U. S. Dept. of Commerce)

*Revised.



View of Heat Treating Department, at Gas Machinery Company, shows NOPAK Cylinders which dip baskets of parts into quenching tanks.

Quench Dipping with NOPAK Cylinders

Expedites Heat Treating Cycle

At the Gas Machinery Company, Cleveland, Ohio, work-pieces are conveyed from the heat treating furnaces into wire baskets which are then immersed into a quenching bath by a series of NOPAK Cylinders mounted vertically above the quenching tank. After quenching, the baskets are lifted out of the tank by the cylinders, and the parts are transferred to another conveyor, with the aid of another NOPAK Cylinder, for further processing.

This installation is typical of the many materials-handling operations in which NOPAK Valves and Cylinders are used. For others see the NOPAK Application Manual.

GALLAND-HENNING MANUFACTURING CO.

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Refer to Sweets File for Product Designers or write for Bulletin SW-1

Representatives in Principal Cities

NOPAK VALVES AND CYLINDERS

DESIGNED for AIR and HYDRAULIC SERVICE

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TOOLS AND DIES—

New strict tolerances hampered by lack of skilled personnel and by existing equipment not suited to today's rigid demands

LACK OF skilled personnel in this field is one of the chief sources of regret. Prime reason for this lack is the fact that tolerances in machining are now in the .0000 thousandths instead of in the .000 thousandths, and most of the "old timers" were trained in the range of .000 thousandths.

Secondly, and equally contributive to this industrial dilemma, is the fact that most of the equipment heretofore manufactured was not made to do work to such precise tolerances as are now demanded.

Even though some groups are working at it, generally speaking effective training programs are sadly lacking to tune in the tool and die makers on today's precise requirements, and even though the machine tool industry is highly productive currently, it still has not been able to produce enough equipment of the capacities now required today, to fill the bill.

Volume about same

There is not much actual difference in the amount of work in shops between this year and last. This industry is feast or famine, and since Korea this industry has been kept busy much more than in normal times. Still, some shops have experienced slack periods. The few tool and die shops that are equipped to do large work (shops that are equipped with large sized equipment and large jig bores for precision work) have been kept steadily busy. Practically all shops in defense areas are working a minimum 50-hour week.

Trend in production has not changed much. Equipment is still difficult to secure. Old and worn-out equipment that will not hold the present tolerances is plentiful. There has not been too much difficulty in securing steel to build tools, and the greater percentage of this work has been in rockets, guided missiles, and radar. The quality of this work is the highest ever expected to be achieved, according to a spokesman for one of the organized groups in this industry.

According to opinions from many sources, it appears that there will be no letdown next year. At present, engineers and tool engineers are busy in planning and designing, which means plenty of fabrication work to come.

Activity in the aircraft field has not been too heavy, probably because of the stretch-out program instituted about a year ago. This program delayed the delivery dates of planes over a much longer period than originally specified, which naturally spreads out the work program.

Effect of jet planes

The type of engineering and design of the jet plane is entirely different from that of the modern gasoline motor powered plane, and this change also affects the tool and die industry.

Jet planes are designed much heavier than gas powered planes. For example, one jet plane has a wing skin 5/16 in. thick on the leading edge and 1/8 in. thick on the trailing edge. This makes it necessary to machine the skin to precision dimensions, since it cannot be fabricated from sheet metal.

This situation prevails in many parts of today's jet planes, and it is necessary because of the extreme speed and heat encountered in flight. Result is that many parts of the jet planes have to fit with precision machining and in order to do so it requires much closer tolerances than the plane industry has had in the past. This situation is evidently part of the tool and die shop industry's problem.

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If you have surplus steel coils or have sizes of steel that are obsolete for current production... let us convert it to your exact needs. We have the annealing and cold reducing facilities to do the job.
Should you want technical help or more information about CALSTRIP steel.. just call UNderhill 0-1344.
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Calstrip STEEL CORPORATION
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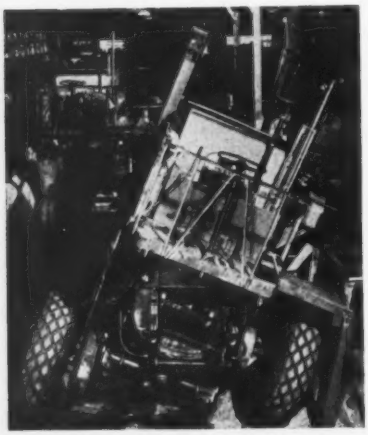
FARM MACHINERY—

West uses from 15 to 20% of all the farm machinery, and is making an increasing part of it



SIDEHILL combines are peculiar to the West. Assembly line at Harris Manufacturing Co., Stockton.

HEAVY-DUTY tillage equipment for specialty crops constitutes the bulk of Western farm machinery manufacturing. All the overhead sprinklers for the entire country are produced here.

FARM MACHINES AND EQUIPMENT
(U. S. Bureau of Census)

Value of Manufacturers' Shipments by Geographic Division and State, 1951
(in thousands of dollars)

	Total	Complete Units	Attachments and parts
Plows, Listers, Harrows, Rollers, Pulverizers, and Stalk Cutters			
Mountain	1,850	1,734	116
Pacific	19,349	15,680	3,669
Cultivators and Weeders			
Mountain	373	345	28
Pacific	3,649	2,238	1,411
Sprayers and Dusters			
Mountain	—	—	—
Pacific	4,239	2,908	1,331
Harvesting and Haying Machinery			
Mountain	1,316	963	353
Pacific	6,430	4,376	2,054
Machines for Preparing Crops for Market			
Mountain	—	—	—
Pacific	1,344	1,195	149
Farm Poultry Equipment, Farm Dairy Machines and Equipment			
Mountain	—	—	—
Pacific	1,973	1,741	232
Farm Elevators and Blowers; Farm Wagons, Trucks and other Farm Transportation Equipment			
Mountain	750	683	67
Pacific	2,412	2,331	81
Tractors for Farm Use			
Mountain	—	—	—
Pacific	2,878	1,887	991

PUMPS—

Prospects for 1953 good, but possibly below 1952 — Sprinkler irrigation grows in popularity

CRYSTAL-BALL gazing in the vertical turbine pump industry is just about as accurate at this time as it was in the political field on November 3 last. However, there are some basic indications that reflect a brisk 1953 business, yet not quite so good as last year's.

For example, many of the cotton growers in California's San Joaquin Valley have been directing their 1952 crops to government warehouses, where they were placed under government loan.

This action resulted from low cotton prices, and although it brought the growers some immediate cash, a market of this type is not usually conducive to additional expansion or large capital investment to increase crop output in the months ahead.

There will be a substantial volume of business in producing more water from existing wells, and it seems likely that sprinkler irrigation will become popular inasmuch as a considerable saving can be realized with this type of irrigation application.

CEMENT—

Entrance of Ideal into Coast field is the big story — Three plants in California purchased

MOST IMPORTANT cement news this year was the purchase by Ideal Cement Co., Denver firm, of Pacific Portland Cement Co., in Ideal's first step into the West Coast. This purchase includes three plants: one in Redwood City, Calif., another in San Juan Bautista, Calif., and a third in Gold Hill, Oregon.

These are all old plants, particularly the one at San Juan, with the next youngest at Gold Hill. Eyes and ears of the cement industry are all focused on Ideal to see what disposition will be made of these plants as well as what other activity the firm may enter into on the coast.

Second most important is news concerning Permanente Cement Co., now one of the two largest cement plants in the world, with installation of their fifth kiln, additional ball mills, and auxiliary equipment, stepping up their annual production capacity by 25%, to 7,000,000 barrels of finished cement.

Permanente has built new distribution plants in Anchorage, Fairbanks

ENGINES—

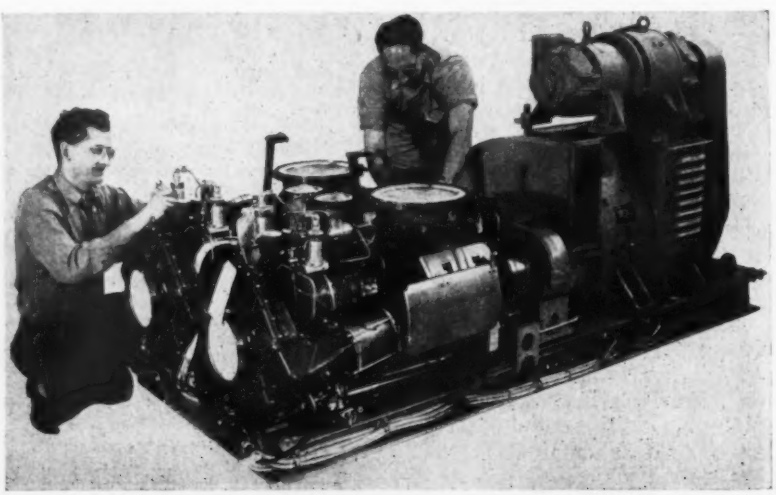
This should be a good story, but most of the information in this field is now classified

TOTAL VALUE of internal combustion engines shipped in 1951 by eight plants located in the Western states amounted to $9,000,000. Corresponding figures for 1950 are 10 plants and $5,000,000.

All of these plants are located in California and Washington; none are located in any of the other nine Western states.

These data furnished by The Bureau of the Census do not include the value of interplant transfers or automotive and aircraft engines.

BOEING'S gas turbine generator-unit is an example of the Western engine production. Users of Boeing's turbine include the Navy, also heavy-duty trucks and helicopters



and Kodiak, Alaska, served now from the Seattle distribution plant by 18,000-barrel capacity steel barges (converted LST's) towed across the Gulf of Alaska.

A 60,000-barrel capacity distribution plant in Long Beach was also purchased from Santa Cruz Cement Co. This plant is not yet in operation, but when it is put into Kaiser service, that firm will have a complete system of distribution plants in every major Pacific Coast population center.

Calaveras Cement installed a new kiln last year, increasing their daily production by about 2,500 barrels.

FINISHED PORTLAND CEMENT PRODUCTION
(thousands of barrels)
From U. S. Bureau of Mines Report

	12 mos. ended October	
Produced in	1951	1952
Colo., Ariz., Wyo., Mont., Utah and Idaho	8,636	8,099
California	29,409	29,190
Oregon and Washington	7,754	7,577

RARE EARTHS—

Idaho has been discovered as a new, local source of monazite, a rare earth previously imported

IDAHO is a prolific source these days for rare earths. Primary product is monazite, from which come such rare earths as thorium, ilmenite, magnetite, cerium, lanthanum, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, lutetium, garnet, zircon, and a very small amount of uranium.

Generally referred to as black sands, monazite contains many of the rare earth elements sorely needed by American industry and because of its content of fissionable thorium, production is controlled by the AEC.

This means that a producer must have a license from the AEC that sales are subject to the commission's approval. The government purchases some of the monazite now in a magnetic processing plant at Boise, and the remainder is shipped to Chicago.

Up until 1949, the United States imported most of its monazite sands, 75% coming from India and the remainder from Brazil, although small quantities were dredged up in the Carolinas and Florida. When exports to the U. S. were stopped, American manufacturers started a hectic search for domestic supplies, a search that has resulted in the feverish activities in Idaho and may well write a brilliant new chapter in the Gem State's already bright mining history.

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TROJAN STEEL SKIDS
Ideal for transfer and storage. Greater durability and stronger than wooden skids. Steel runners optional. Available in all the popular sizes.

TROJAN STEEL PALLET
For strength and durability. Z supports withstand maximum load requirements. Available with diamond pattern floor plate as shown or with smooth steel deck.

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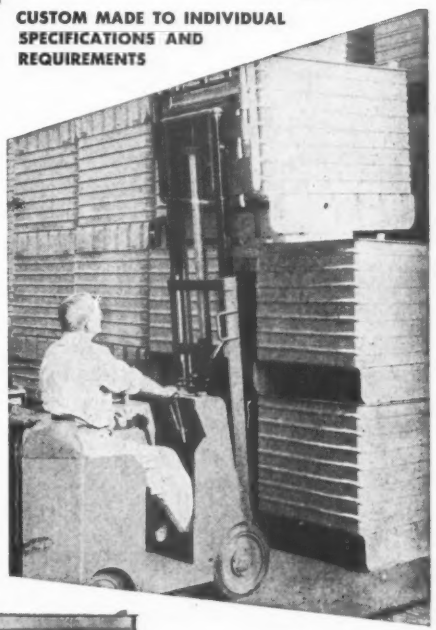

OTHER TROJAN PRODUCTS

Steel Shelving
Storage Racks (all types)
Counters
Rubbish Boxes
Live Skids
Platform Trucks
Box Trucks
Tank Trucks
Bakery Pan Trucks and Racks
Dough Troughs
Shop Boxes

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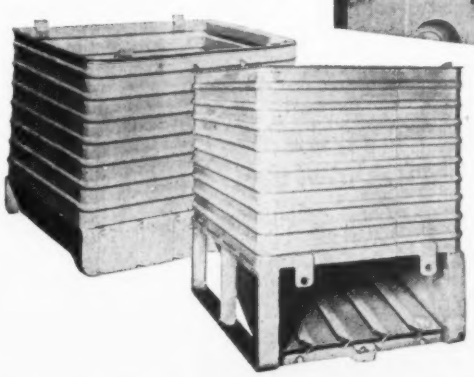

TROJAN CORRUGATED TUB SKID
For easy handling of forgings, castings and other metal parts. Sides are formed of 12 gauge corrugated steel welded to 10 gauge steel underskid. Provided with four tiering rings, or can be perforated and lifting rings inserted. Drop bottom type shown in foreground.

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CLAY, BRICK and TILE—

New, larger brick makes auspicious debut —Steady increase in use of fork lift trucks and conveyors

STRUCTURAL clay products shipments in 1952 generally took a rise from the high years of 1950 and 1951. As of September 1952, shipments for the 11 Western states are 15% above those for the same month a year ago. California is now running shipments 10% higher than this time last year.

However, the construction season got off to a slow start in 1952, and the year-end totals are not expected to show this much increase over 1951. This is somewhat justified by the fact that production, as opposed to shipments, took only a 1½% rise over this time 1951 in the 11 Western states, and an 11% drop in California.

The California picture, high shipments and low production, is possibly explained by the fact that during the long construction tieup due to strikes early in the year, brick manufacturers stockpiled to their capacity. The tieup, in fact, gave many individual manufacturers a chance to catch up on backlog orders. More manufacturers maintained capacity production during the strike than slowed down to fractional output.

These stockpiled bricks have already been shipped and are probably not the ones being sold at this time, but nevertheless the large stockpiles may account for the lag in production under the high sales. The picture will soon reverse, and stockpiling for the early 1953 construction season will soon begin, if it has not already.

The picture nationally is that brick production for the first three quarters of 1952 is 4% below the totals for last year, with shipments about the same. However, as is the case with many products, slight recessions throughout the country may not be felt in the expanding West.

New Product

In 1952 a new type of brick was manufactured and promoted on a national scale. Called the "SCR brick"* the new unit is the first successfully designed through-the-wall unit ever seen in the United States. Main advantage of the new brick is its lower in-place cost, due to the fact that bricklayers are able to place about the same number of the new units as of the standard size common brick, about one-third smaller in size. The new unit is also acceptable in earthquake areas, as are the standard brick when properly designed and built.

Plant Expansion

No new plant expansion was seen within the brick industry, except in isolated cases. Modernization of existing plants is continuing at a steady rate, with the addition in many plants of improved materials handling equipment, such as fork lift trucks and individually-designed conveyor systems for the raw clay. Within the broader field of ceramics, taking in all types of tile, the plants are expanding at a faster rate and the outlook for new equipment is even larger.

* Copyrighted; pat. pending.

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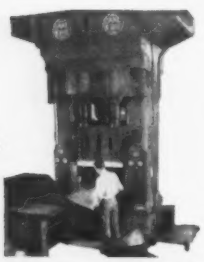
CHECK YOUR OFFICE LIGHTING

Take a good look at your General Office. Here are workers trained at great expense to use precision "tools"—typewriter, calculators, business machines of many types.

Their ability to get the most from these "tools"—to make full use of this training and experience—is dependent upon good illumination.

Smoot-Holman efficient lighting helps eliminate costly mistakes, lost time and eye fatigue.

There is a Smoot-Holman fixture to meet every need and there is no finer lighting equipment made in the West. For the solution to your lighting problem, see your Smoot-Holman Lighting Engineer!



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COTTON—

Mechanical pickers started a revolution now making its impact in many diverse industries

WITH the unparalleled invasion of mechanical cotton pickers into California (over 4,000 of them during the past six years) has come other machinery, such as improved cotton trailers, field loading machines, and modernization of cotton gins to handle machine-picked cotton properly. This agricultural-industrial revolution has involved an investment of more than $50,000,000.

J. Earl Coke, University of California Extenson Director, who made the foregoing observation, further indicated that "We are not only greatly interested in mechanization, but dependent upon it for our cotton production. Our large level fields are well suited to the efficient use of large power machinery. Our farmers are machine-minded."

A case in point is William B. Camp, of Bakersfield, one of the California cotton producers. He farms 7,000 acres, much of which is planted to cotton. Lest any Easterner think this is a major operation, it may be said that Mr. Camp cannot hope to compete with such agricultural giants in California as Crocker and Gambogi, of Corcoran, who farm something in the neighborhood of 95,000 acres.

The story of the cotton industry in California is not just the story of planting and harvesting mighty crops. It is also the story of the cotton gin, the cotton seed oil mill, and the many other industries that work with the cotton farmer. Fabrication and erection of steel has played its part too.

Structures around a cotton gin consist of a building to house the gin, and its machinery, plus a wagon shed, water tank, cotton seed bunker, and cotton house.

A check of the work done by Consolidated-Western Steel Division of United States Steel Co. over the past year is a good measure of the great growth of the cotton industry in California. Not alone in the field, this firm has fabricated and erected well over 100 different structures for the cotton industry in the past year. This includes 22 complete gins, counting cotton seed stackers or oil mill structures.

MECHANIZATION GOES UP WITH PRODUCTION

(Bureau of the Census)

Western cotton-producing states, in order of production importance are: California, Arizona, New Mexico and Nevada. California now ranks second in the nation, with Texas holding first place.

COTTON PRODUCTION

Cotton production for 1952 estimated as of last November first is as follows:

California, 1,865,000 bales, with a per acre yield of 640 lbs.
Arizona, 1,050,000 bales, with a per acre yield of 757 lbs.
New Mexico, 310,000 bales, with a per acre yield of 503 lbs.
Nevada, 2,250 bales with a per acre yield of 600 lbs.

MECHANICAL HARVESTING

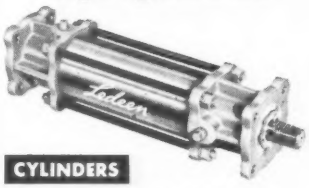
Arizona, in 1950, produced 474,000 bales, picked 9% by machine.
California, 1950, produced around 1,000,000 bales, picked 34% by machine.
Arizona, 1951, produced 803,000 bales, harvested 26% mechanically.
California, 1951, produced around 2,000,000 bales, picked 53% by machine.
California, 1952, reaps estimated 75% of the crop mechanically.

CULTIVATED ACREAGE

State	1952	1951	Avg. 1941-1950
California	1,399,000	1,331,000	485,000
Arizona	666,000	548,000	235,000
New Mexico	296,000	328,000	159,000
Nevada	1,800	—	—

Ledeen

PNEUMATIC & HYDRAULIC Equipment



CYLINDERS

For air, oil, water, gas or steam operation—in standard and special diameters and stroke lengths.

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For operating air and hydraulic cylinders and motors, single and double acting. Hand, foot, power and solenoid operated.

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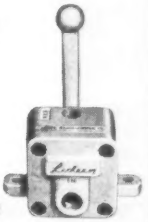

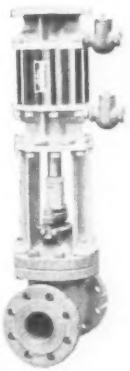

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For power operation and remote control of line valves. Adaptable to most any make, size and type of valve, to operate against any line pressure, for any fluid medium, with any pressure.

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AIR-HYDRAULIC PUMPS

High pressure oil, from plant air supply. For clamping, drawing, forming, testing and other operations requiring long high pressure cycles without vibration or overheating. Ready for connection to plant air and hydraulic lines.

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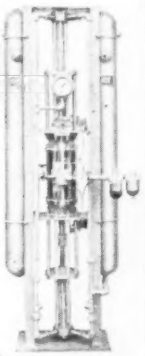

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AIR-HYDRAULIC PUMPS & BOOSTERS
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Los Angeles 15, Calif.

THE WEST ON ITS WAY

ARIZONA

CERTIFICATE OF NECESSITY — Defense Production Administration issues certificate of necessity for the following defense-connected industrial project: Arizona Public Service Co., Tucson, $10,900,000 for electric power with a fast write-off at 45%.

COTTON OIL PLANT—Chickasha Cotton Oil Co., Chickasha, Okla., plans construction of a $1,500,000 cotton oil mill on a 40-acre site near Casa Grande on Gila Bend Highway. Mill, to have daily capacity of 150 tons of cotton seed, will be ready for use when next year's cotton crop is harvested.

COOLER FIRM EXPANDS — International Metal Products Co., Phoenix manufacturer of evaporative coolers, commences a $200,000 modernization and expansion program on its plant at 500 S. 15th St.

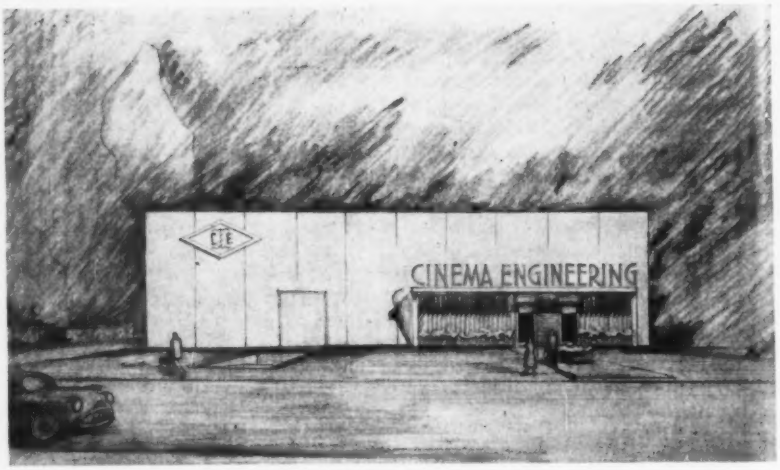
AIR FORCE PROJECTS—The Corps of Engineers plans on spending between $13,700,000 and $38,300,000 on air base and airport projects in Arizona. Included in this are 23 separate projects at Davis-Monthan Air Force Base in Tucson; 17 projects at Luke Air Force Base, Litchfield Park; 12 projects at Williams Air Force Base, Chandler; 44 projects at Yuma Test Station, Yuma; and 14 projects at Yuma airport; plus other projects in the Tucson area.

CALIFORNIA

SHELL EXPANDS AT VENTURA—Shell Oil Co. awards a $1,000,000 contract to Fluor Corp., Ltd., for revisions and extensions to Shell's Ventura natural gasoline plant. This expansion program, the second major extension within five years, will increase plant by one-third.

DODGE ADDS AT SAN LEANDRO—Dodge Division of Chrysler Corp. plans a 68,000 sq. ft. addition to its San Leandro automobile assembly plant. This addition, which will lengthen present plant by 211 ft. and widen it by 320 ft. will enable Dodge to install new conveyors and to re-arrange present assembly lines for more efficient straight line operation. Building, to be joined to rear of existing plant, will have concrete walls and floor with structural steel framing and steel window sash.

In a new two-story, 750,000 sq. ft. building adjacent to assembly plant, Dodge is installing equipment for manufacture of Navy and Air Force aircraft propellers as well as for automobile bodies.



CINEMA NEWS—Cinema Engineering Co., Burbank electronics firm, breaks ground for a new plant at 1100 Chestnut St., Burbank. Completion of this one-story, fireproof, air-conditioned structure, containing 18,000 sq. ft. of floor space, is scheduled for May of this year. It will make possible consolidation of firm's facilities.

DURANT DOUBLES—Durant Insulated Pipe Co. moves to a new plant at Warren Way and Bay Road, Palo Alto, which more than doubles capacity of old plant located at 1015 Runnymede St. New structure is situated on a three-acre site with warehouse and fabricating areas covering approximately 30,000 sq. ft.

NEW PLANT FOR SHAMBAN—W. S. Shamban & Co., designer and manufacturer of specialized plastics, is constructing a building at 11617 W. Jefferson Blvd., Culver City, that will increase by 300% capacity for manufacture of molded and fabricated aircraft and industrial fluoroplastic products.

SMITH GOES TO OAKLAND—A. O. Smith Corp., Milwaukee, Wis., moves its West Coast product service division from Los Angeles to Oakland. Firm is constructing a 12,000 sq. ft. facility on a five-acre site at 66th Ave. and Eastshore Freeway. Investment in real estate and plant is estimated at $250,000. Newly located branch will cover the 11 Western states and perform the following functions: servicing water heaters, warehousing and stocking parts, and operating a training school for servicing personnel.

PLANS FOR PALLETS—Bulldog Pallet Co., newly-organized pallet manufacturing firm, will have a production capacity of 1,100 pallets per shift at its plant located on an eight-acre tract on Haley Road in Newark. High production rate is due mainly to installation of latest model Morgan nailing machine and a new type saw which makes 60 cuts per minute.

STEEL TUBING WAREHOUSE—Construction is started on a new 34,000 sq. ft. warehouse for Perry Kilsby Inc., Los Angeles steel tubing distributor. New building of concrete slab construction is located on a 3.25 acre site at 2501 South Malt Ave. A 4,200 sq. ft. office building is being erected on the same site.

TRANSFORMER TRANSACTION—G. L. Ohrstrom Associates, The Plains, Va., acquires for an undisclosed amount, Jeffries Transformer Co., Los Angeles producer of high quality electrical trans-

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formers and coils for aircraft. No changes in operation or policy are contemplated. This is seventh manufacturing company now owned by G. L. Ohrstrom Associates, which specializes in acquisition of going companies producing top quality products.

HENSLEY'S NEW PLANT — Hensley Equipment Co. invests $50,000 in construction of new plant facilities and offices at 816 98th Ave., Oakland, adding 6,000 sq. ft. of floor space and providing 12,000 ft. of plant under cover. New area will house general offices, presently located in San Leandro, parts facilities, and show room. Manufacturing and heat treating operations will continue to be conducted in adjoining property at 828 98th Ave.

NEW NORTHROP WAREHOUSE — Northrop Aircraft, Inc., Hawthorne, constructs a 72,000 sq. ft. concrete warehouse on Santa Fe industrial tract at El Segundo. Building will be used for general warehouse purposes in connection with Northrop's long range U. S. Air Force Scorpion F-89 and guided missile programs.

FOOD PLANT ACQUISITION—A. D. Atterbury Packing Co., Yuba City, which went into bankruptcy in 1950, is turned over to ownership of Sacramento Frosted Foods Co., which has been operating it under a lease agreement for about a year.

STOCKTON BOX REBUILDS—Stockton Box Co., Lodi, which was completely destroyed by fire last summer, will be rebuilt on a new site next to Lodi Stadium. New factory will include a 24,000 sq. ft. warehouse and facilities for 40 employees.

GLASS HOUSE — International Glass Corp., optical glass manufacturer, acquires assets and corporate structure of Soft-Flex Glass Fabrics Corp., Puente, in order to have additional facilities for diversifying its operation into more commercial fields. Name will be changed to International Glass Fibers Co., and about $150,000 will be spent enlarging plant.

ANCHORS AWEIGH—Keel is laid on SS. Golden Mariner, a 13,000-ton vessel to be built at Bethlehem Pacific Coast Steel Corp. This is first of five single screw cargo ships to be constructed for the Government, and is first large ocean going vessel to be built on Pacific Coast since World War II.

REPORT FROM FMC—Food Machinery and Chemical Corp., San Jose, acquires Mowamatic Corp., Mount Vernon, N. Y. producer of power lawn mowers. Newly purchased firm will be operated as a subsidiary unit, and sales headquarters will be transferred to Port Washington, Wis.

Food Machinery and Chemical Corp. is awarded an Army Ordnance contract to produce a new type of personnel carrier developed by FMC's engineering department. Tank is essentially a land vehicle, but has swimming capabilities.

UNITED EXPANDS OVERHAUL FACILITIES — United Air Lines plans a two-year building program which will more than double overhaul facilities at its San Francisco "push button" main-

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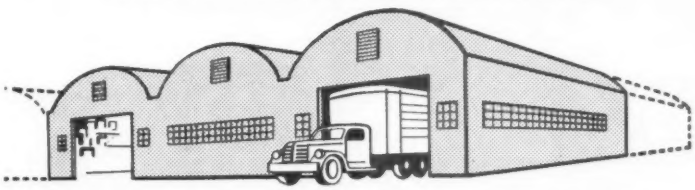

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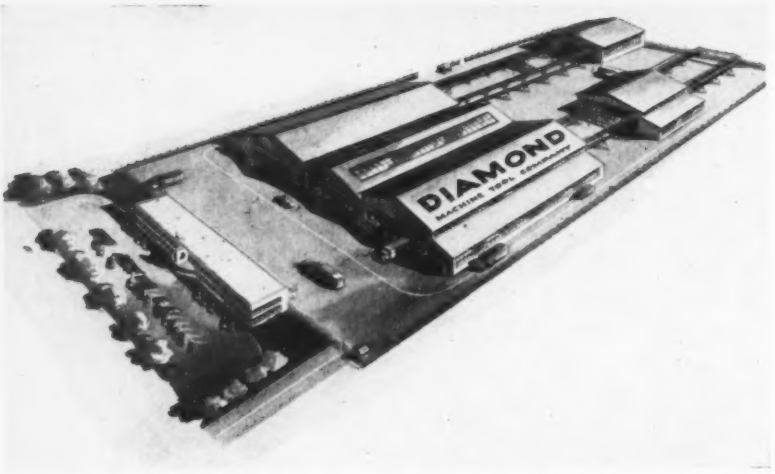

DIAMOND BUILDS—Nearly completed is Diamond Machine Tool Co.'s new factory, being constructed on a five-acre site at Pico. Building will have over 55,000 sq. ft. of manufacturing area, exclusive of general offices, and will house all modern equipment and machinery for manufacture of Diamond's complete line of machine tools.

tenance base. About 160,000 sq. ft. of shop, office and hangar space will be added, making it possible to overhaul about 27 planes per month. Base personnel will be increased from 2,500 to 2,800.

United Air Lines has ordered another five Mainliner Convair Model 340 aircraft from Consolidated Vultee Aircraft Corp., bringing a total of 55 such transports to this firm.

WORLD TRADE CENTER—Plans are completed for construction of the first unit of the San Francisco World Trade Center, which will utilize entire north wing of the Ferry Building. Project, dedicated to stimulation of international trade through Port of San Francisco, is sponsored by the Harbor Board and World Trade Center, Inc., an organization formed for promoting this center. Harbor Board has earmarked $2,000,000 to build initial unit, and other units will be built later.

BUTCHER SHOP—L. H. Butcher Co., subsidiary of Udylite Corp., erects a new building in Los Angeles to house its manufacturing facilities and provide more laboratory space.

STORAGE BATTERY PLANT—Delco-Remy Division of General Motors Corp., Anderson, Ind., plans construction of a West Coast automobile storage battery plant at Anaheim on a 90-acre site west of Magnolia Ave. between LaPalma and Southern Pacific Railroad. Modern plant will cover 175,000 sq. ft., and about 300 persons will be on payroll.

BOX FIRM SOLD—Assets of Lassen Lumber & Box, Inc., Susanville, are transferred to Fruit Growers Supply Co., for an undisclosed amount. Sale includes all buildings, machinery, equipment and lumber stores held by Lassen Lumber & Box.

A LOCKHEED ORDER—Lockheed Aircraft Service, Inc., is awarded approximately $2,000,000 in contracts for conversion of 22 commercial Constellation and DC-6 deluxe air transports into interiors for scheduled international tourist and domestic coach operation. This is the largest volume of commercial conversion work ever awarded to an independent aircraft overhaul company, according to Lockheed officials.

LA HABRA BECKONS BECKMAN—Beckman Instruments, Inc., South Pasadena manufacturer of scientific and industrial precision tools, will move to a

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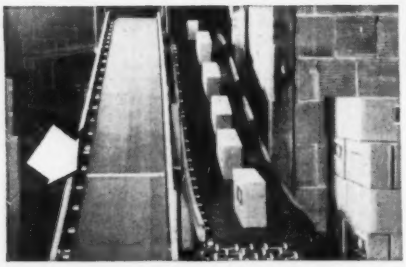

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new $2,000,000 plant on a 45-acre site in La Habra late this year. New plant, consisting of about 40,000 sq. ft. of assembly plant, warehouse and machine shop, will accommodate consolidation of Beckman's operations now scattered in 17 different locations.

DRINK SITE — Bireley's Beverages is constructing a 25,000 sq. ft. distributing plant at Fifth and Cedar Sts. in Oakland. New $250,000 unit will serve San Francisco, Oakland and Marin and Contra Costa counties, and will employ about 50 people.

L. A. PURCHASING BRANCH—Biddle Purchasing Co. of New York opens a new branch in Los Angeles at 727 West Seventh St. Activities will be confined to purchase of hard lines such as plumbing supplies, electrical supplies and housewares.

AIRCOACH SEAT CONTRACT—Burns Aero Seat Co., Burbank manufacturer of airplane seats, is awarded a $100,000 contract for high density aircoach seats for American Airlines, Inc.

LASSEN JINGLES SOLD—Lassen Telephone Co., Susanville, is purchased by Citizens Utilities Co. for $16,425. Line serves Janesville, Johnstonville, Buntingville, Standish, Litchfield, Herlong Junction and vicinity in Lassen County.

UTILITY PLANS — Pacific Lighting Corp. incorporates a new wholly-owned subsidiary, Gas Supply Co. of California, and requests a certificate of convenience and necessity from California Public Utility Commission to operate new firm as a public utility. If permission is granted, new utility firm will acquire properties and assets of present Pacific Lighting Gas Supply Co., a non-public utility, and sell natural gas to Pacific Lighting's two utility subsidiaries, Southern California Gas Co. and Southern Counties Gas Co.

RICH GETS RICHER—The Rich Plan Corp., seven-year-old Los Angeles freezer food plan firm, moves to new building to accommodate increased business. According to Rich executives, firm realized about $20,000,000 in retail sales in 1952 as against $4,000,000 for 1951.

NEW SOLAR CONTRACT—Solar Aircraft Co., San Diego, is awarded a $2,000,000 contract to equip U. S. Navy vessels with gas turbine engines.

TAPE TALK—Technical Tape Corp., New York and Montreal manufacturer of adhesive, cellophane and surgical tapes, expands its Pacific Coast facilities by forming a new subsidiary, Technical Tape Corp. of California. New firm, to operate in a new plant at Burbank, will produce specialty tapes.

MORE ABOUT PICKLES — Lady's Choice Fine Foods, with offices in Los Angeles and San Francisco, acquires a modern pickle processing plant in Hayward from John Haar interests for an undisclosed price. Plant, with a capacity of 5,000 tons annually, is located on a 4½ acre site, and is one of the largest single pickle processing plants in the West.

SHEET STEEL PLANT—Marwais Steel Co. commences construction of a sheet steel plant in the Vail Field section of Central Manufacturing District, Los Angeles. Plant, to be in operation by April, will have a monthly capacity of more than 5,000 tons of sheet a month.

LINDE HAS FIRE—Linde Air Product Co.'s acetylene plant in the El Sereno industrial section of Los Angeles was demolished by an explosion and fire early last month. Damage is estimated at $1,000,000.

CANDY GAINS—Cora Lou Confectioners, Inc., San Francisco, purchases Allegretti Candy Co., also of San Francisco, for an undisclosed price. Both lines will be manufactured in a new 50,000 sq. ft. building soon to be leased by Cora Lou Confectioners. Present plants of both companies will be sold.

SMELTING FIRM MOVES — General Smelting & Refining Co. plans to move its operations from Los Angeles to College Grove, Tenn. Hester Battery Manufacturing Co., Nashville, will use all of the lead smelted at the new plant.

GOBLETS BY GOSH—Libby Glass Division of Owens-Illinois Glass Co. starts production in Los Angeles in new facilities near parent company's L. A. operations. This is first operation located away from home plant (Toledo, Ohio)

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in company's 134-year history. Initial production will be heat-treated tumblers for hotel, restaurant and institutional trade, and decorated tumblers for home use. Plant will serve West Coast, Canada and South Pacific.

CONVAIR SELLS AD BUILDING—Consolidated Vultee Aircraft Corp. sells its eight-story, reinforced concrete administration building to New York realty firm of Webb & Knapp for $2,700,000, which is believed to be the largest purchase price for any single piece of property in San Diego County. Structure, containing 161,600 sq. ft. of space, is leased back on a 25-year basis and will continue to house Convair's corporate offices.

MORE ABOUT CONVAIR—U. S. Air Force requests Consolidated Vultee Aircraft Corp., San Diego, to prepare design studies for a supersonic bomber. New model would be designed for extremely high performance, according to Air Force spokesmen. As yet no contract for construction is involved.

NEW CONTRACTS FOR FLUOR—Fluor Corp., Ltd., Los Angeles engineering firm, receives a contract from Richfield Oil Corp., totaling approximately $1,000,000, for construction and design engineering of a catalytic polymerization unit at Watson to be completed early in 1954.

Contract for construction of a fourth unit of California Electric Power Co.'s plant at Highgrove is also awarded to Fluor Corp. This consists of a 40,000 kw. steam electric generating station which will cost about $5,000,000 to build. Fluor has already completed the first three units of this plant.

SAN DIEGO TO SHIP SULPHUR—International Sulphur Corp., with headquarters in San Diego, plans to ship thousands of tons of bulk sulphur through that port. Large shipments to European ports are already under way. This corporation is developing a huge sulphur deposit in Baja California and sulphur from it will be moved by truck to San Diego and then by ship to many foreign ports. This commodity is used principally in the manufacture of steel.

GAS INCREASE ASKED — Southern California Gas Co. and Southern Counties Gas Co. ask for permission to enlarge their Texas-California gas transmission facilities. New transmission, if granted, will raise capacity from 555,000,000 to 705,000,000 cu. ft. daily.

LASSEN IMPROVEMENTS SLATED—Fruit Growers Supply Co. plans reconstruction of two of its four furnaces in the power house of its Susanville plant. Conversion of half of the lumber drying yard into a noselift lumber carrier operation is also scheduled. Converted section of yard will handle about 12,000,000 board ft. of lumber.

COLORADO

CF&IC BUYS ROEBLING FIRM—A wholly-owned subsidiary of The Colorado Fuel and Iron Corp. acquires all the manufacturing business, plants and inventories of John A. Roebling's Sons Co., Trenton and Roebling, N. J. producer of steel wire, cold rolled steel specialties, wire rope, electrical wire and cable and bridge products. Roebling business will be operated as a subsidiary of Colorado Fuel and Iron under the Roebling name.

NEW DENVER DEVELOPMENTS—Bowman Biscuit Co. plans construction of a manufacturing and distributing plant development adjacent to Denver's Chaffee Heights district which will cost between $8,000,000 and $10,000,000. Project will be started within three years time, and will employ about 1,500 persons when completed. Garrett-Bromfield & Co. plans to build a $1,750,000 business and residential development adjacent to Bowman property. Project, which calls for construction of 100 cottage-type houses and duplexes in addition to Garrett-Bromfield's Chaffee Heights development, will also double present business facilities in that area. The Denver & Rio Grande Western Railroad also plans a development, immediately east of the other two projects.

NEW RISS TERMINAL—Riss & Co., Inc., Kansas City, Mo., trucking firm, plans to build a new $500,000 terminal in Denver. Riss & Co., which incorporated in Colorado in 1926, now operates in 22 states. It grossed $24,890,889 in its last fiscal year, and in the current year will handle more than 2,500,000,000 lb. of freight.

URANIUM ORE CENTER—Grand Junction is slated to become the center of U. S. Atomic Energy Commission's uranium exploration and procurement programs on the Colorado plateau. AEC has set up a new office authorized to direct and coordinate government activities related to finding, mining and processing of uranium ores and purchase of uranium concentrates on the plateau. In connection with this, the commission plans to build a new pilot processing plant for atomic ores in the AEC compound there. Plant, to be operated by American Cyanamid Co. technicians, will aim at testing methods of reducing costs of milling uranium ores. Also under way are plans for two additional mills to process uranium ore from the Colorado plateau. One will be built near Hite, Utah, and the other at Shiprock, N. M. They will cost between $1,500,000 and $3,000,000 each, and be built by private companies. Anaconda Copper Mining Co. is now building a similar plant near Grants, N. M. The Grand Junction office will now be placed on a par with nine other top AEC offices in the country.

IDAHO

LUMBER COMPANY SOLD — Boise-Payette Lumber Co., Boise, announces the purchase of Halleck & Howard Lumber Co. properties in Valley and Boise counties. Difficulty of supervision between the company's headquarters and southern operations was primary reason for sale. Price was not disclosed.

MORE PHOSPHATE FERTILIZER—Gates Bros., Inc., manufacturer of phosphate fertilizer, Wendell, will combine its experience with The Ralph M. Parsons Co., Los Angeles constructor, to build phosphate fertilizer plants throughout the world. Gates Bros.' modern high

analysis fertilizer plant is using a continuous processing technique requiring about three hours time from raw rock to finished product. The Ralph M. Parsons Co., maintaining offices both here and abroad, is engaged in design and construction of facilities for process industries on a world-wide scale.

ATOMIC ENERGY INFORMATION—Idaho Operations Office, U. S. Atomic Energy Commission, plans construction of a hot cell and hot cell building at National Reactor Testing Station, Idaho Falls. This two-story pumice block building will permit visual examination, modification, adjustment, and repair of experimental equipment after irradiation in reactor. A lump sum contract is awarded to A. Nishkian and Co., Long Beach, Calif., to design boiler plant facilities for testing station's chemical processing plant.

SMELTER GASES BECOME SULFURIC ACID—Sullivan Mining Co. has started construction on a $5,300,000 sulphuric acid converter to utilize stack gases from zinc section at Bunker Hill Smelter, Kellog. A daily production of 250 to 300 tons of sulphuric acid is expected and will be used mainly in production of phosphate fertilizers.

NEW POWER UNIT FOR CLARK FORK—Washington Water Power Co. puts into service a second generating unit on its $46,000,000 hydroelectric project on Clark Fork River. Unit has a capacity of 50,000 kw., and will be used only part time because of low water conditions.

MONTANA

RADIO NETWORK NEARLY COMPLETED—The Montana-Dakota Utilities Co. is nearing completion of a $250,000 short-wave radio system covering 2,850 miles of electric transmission lines and 1,400 miles of gas pipe line. Purpose of this system is to improve service for 64,000 electric and 65,000 gas customers. System includes 26 fixed transmitting stations located on high points of land or buildings with remote control units located in company's offices.

TUNGSTEN DEPOSIT WORTH MILLIONS—Two mining engineers estimate a value of more than $10,000,000 for a deposit of strategic tungsten ore at Brown's Lake tungsten project in Beaverhead County. Ore body is about 800 ft. long, 60 ft. thick and 150 ft. deep. Its location was indicated by surface trenching and underground work and cost about $200,000.

NEVADA

NEW AEC CONTRACT FOR REYNOLDS—Reynolds Electric & Engineering Co. is awarded a three-part contract for maintenance, minor construction, and scientific structures support services at Atomic Energy Commission's Nevada Proving Grounds near Las Vegas. Contract splits up widely diversified func-

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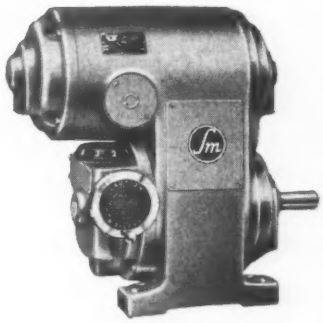

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NEW MEXICO

GOVERNMENT AWARDS FOUR CONTRACTS—Four New Mexico firms have contracts for national defense according to Albuquerque office of U. S. Department of Labor. They are: Glover Distributing Co., Alomogordo, gasoline, $10,000 for General Services Administration; Sine Lumber Co., Albuquerque, lumber, $23,000 for Army; Al Jones Oil Co., Gallup, gasoline, $34,000 for Army; and Famariss Oil Co., Hobbs, gasoline, $117,000; $18,000 for GSA.

SULFATE OF POTASH PLANT—International Minerals & Chemical Corp. plans to build an addition to its sulfate of potash facilities at Carlsbad. Construction starts immediately and the plant is expected to be in production in early 1954. Increased production of about 35,000 tons a year is expected.

MINE INDUSTRY HAILS NEW PROCESS PLANT—Dry beneficiation of minerals will be incorporated in a new plant to be built by Internationl Mineral & Chemical Corp., in Carlsbad.

OREGON

POWER LINK PROPOSED — U. S. Power Commission engineers are now studying a proposal of the California-Oregon Power Co. which would link Northwest's Bonneville power system with California's Shasta system.

ALUMINA PLANT BID ON — Three Western companies have sent in bids on an experimental alumina plant at Salem, built in 1944 at a cost of $5,000,000. They are: Harvey Machine Co., Torrance, Calif.; Schnitzer & Wolf Machine Co., Portland; and Dulien Steel Products, Inc., Seattle.

SHIPYARD GETS CONTRACT — The Willamette Iron & Steel Co., Portland, receives $2,500,000 contract for working on transport General John Pope. Bulk of work will be enlarging ship's troop carrying capacity.

LUMBER COMPANY CHANGES HANDS—Loran and Faye Stewart, C. L. Chapman of Bohemia Lumber Co. at Culp Creek, and Thomas Winn, Eugene, are new owners of the Foster-Clyde Lumber Co. near Gold Beach. Included in sale are 50,000,000 ft. of lumber, all located in Curry County, and a mill which cuts 80,000 ft. per shift.

OREGON NICKEL PLANT—The Hanna Development Co., a subsidiary of M. A. Hanna Co., Cleveland, receives a Defense Production Administration certification for accelerated tax amortization to cover construction of a $3,600,000 ferro-nickel plant at Riddle. The Nickel Mountain ore deposit near Riddle, from which plant will obtain its raw material, is said to be largest reserve of nickel in the United States.

CO-OP BUYS PLYWOOD OPERATION —A new company, Milwaukie Plywood & Door Co., is new owner of Western Door & Plywood Co. at Milwaukie. Agreed price is $1,500,000 of which $50,000 has been paid down. Employees and outsiders form the new cooperative.

WHITE STAG GROWS—White Stag Manufacturing Co. is leasing former Noon Bag Co. building which will give it 50,000 sq. ft. of additional space for office, factory and warehouse facilities.

POWER CONTRACTS PROPOSED—Bonneville Power Administration will let construction contracts totaling more than $10,200,000 for 1953. All contracts are subject to Congressional appropriations, but work is on previously authorized projects.

PLYWOOD PLANT REPURCHASED—Former owners of the bankrupt Interstate Plywood Corp., Bandon, purchase that plant at a bankruptcy sale for $130,000, and will operate it as Bandon Veneer & Plywood Association. When plant resumes greenend activities, it will peel veneer for sale to other plywood companies. After firm acquires a hot press and other equipment, it will continue manufacture of plywood.

MORE ABOUT PLYWOOD—Production of a plastic-faced plywood is under way at Menasha Plywood Corp., North Bend. The plastic overlay material is purchased from Kimberly-Clark Co., Neenah, Wis., and is applied during the regular plywood manufacturing process.

SPRING HAS SPRUNG—Gail Spring Co., a new spring manufacturing plant, commences operation in Portland. This company is using 6,000 sq. ft. of manufacturing space obtained from Triangle Milling Co. Steel springs for upholstering and bedding manufacturing will be produced by new company.

MANGANESE MINING RESUMED—A group of Seattle men operating under the name Crescent Mines, reactivate Crescent manganese property 30 miles west of Port Angeles. Three carloads of ore, assayed at 53% manganese, have been produced, and firm is receiving $120 a ton for the loaded ore.

NEW WAREHOUSE FOR CANNERS—American Can Co. is planning construction of a large new warehouse adjacent to its Portland factory to further expedite and enlarge its service to Pacific Northwest canners and packers. Con-

where to buy....

NICHOLSON files

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taining about 80,000 sq. ft. of floor space, the new warehouse will provide storage space for up to 75,000,000 cans.

PIPE ALLOCATED FOR OIL LINE—Petroleum Administration for Defense is allocating 222,896 tons of pipe line for 14 crude oil and petroleum products pipe lines costing $395,698,000. Among major projects receiving priorities was a 103-mile products line to be built by Cal-Ore Pipe Line Co. from Crescent City, Calif., to Medford at an estimated cost of $2,272,000.

UTAH

GAS LINE PLANNED—El Paso Natural Gas Co. now controls Utah Natural Gas Co. The two companies plan to build a 96-mile pipeline for transmission of natural gas from Clear Creek, central Utah, to Salt Lake City. Estimated cost is $6,500,000.

BIGGER BISCUITS—Purity Biscuit Co. is starting construction on a three-story addition to its Salt Lake City plant.

ELECTRIC UNIT SOLD—Beaver Valley Electric Association, a rural electrification administration project serving 40 to 50 consumers, has been sold for over $12,000. Telluride Power Co. of Richfield is buyer.

WASHINGTON

BARGE LINES MOVE — Tidewater-Shaver Barge Lines is moving its upper Columbia River oil tank farm from Attalia to a point on the north bank of the Snake River and is doubling its plant capacity.

GAS EXPANSION PROGRAM—Northwest Cities Gas Co., anticipating an increase in gas consumption, will begin a new program of gas main installation in Walla Walla. Project will involve replacing old two-inch gas mains with a new four-inch steel pipe. This program, covering most of Walla Walla, will require about one year to complete.

WOOD-FIBER PLANT GROWS—Construction of an addition to Simpson Logging Co.'s wood fiber plant in Shelton is scheduled to begin immediately. The 60 x 150-ft. addition to the finishing room will contain new painting and drying equipment, and will be completed in February or March. The addition will be built by Howard Fuller, Shelton contractor.

PUYALLUP PLANT PURCHASED — Purchase of the R. I. MacLaughlin Co., North Puyallup, has been announced by C. Verne Cedergreen of Woodburn, who will operate the berry packing plant as North Puyallup Packing Co.

AUXILIARY POWER PLANT CONSIDERED—The Reynolds Metals Co., Longview will conduct a feasibility study for an auxiliary power plant to supply its aluminum reduction plant.

WENATCHEE ACTIVITY—The Aluminum Co. of America will partially reactivate a second potline at its Wenatchee plant when a third generator starts operating at Rock Island dam. One hundred men will be added to plant's production force when potline is reactivated.

AIRCRAFT CONTRACT—Boeing Aircraft Co. awards Division of Industrial Research, State College of Washington, a contract for developmental work in production of precision castings. These castings are to be used in production of an experimental gas-turbine engine designed by Boeing engineers.

NO N.W. REFINERY FOR UNION—Union Oil Co. of California drops plans for building a refinery in Puget Sound area. Its option on a 1,000-acre tract near Mukilteo has been allowed to expire.

WYOMING

HUSKY REFINING PROGRAM—Husky Oil Co. plans a million-dollar building program for its Cody refinery. The program will increase refining facilities with addition of asphaltic vacuum unit and a catalytic reforming unit.

COPPER MINE DRILLS—Core drilling operations are under way at the Copper King mine, site of a proposed $1,000,000 mining and milling project. The 10,000,000-ton deposit is expected to run around six dollars a ton.

NEW PIPELINE IN OPERATION—Crude oil is flowing through the 1,056-mile pipeline from Worland, to Wood River, Ill. The new line, now in full operation, is a 100,000-barrel-a-day common carrier.

LAND AIR MOVES TO CHEYENNE—Cheyenne will soon become home of Land Air, Inc. whose expenditures are expected to total some $2,000,000 this year. Employment of 750 persons is expected at height of operations, along with a payroll of $300,000 per month. Although no exact details are known, work will be connected with aircraft modification.

ANOTHER PIPELINE—Pioneer Pipeline is putting into operation a 300-mile pipeline from Sinclair, to North Salt Lake City, Utah. The common carrier, in which Continental Oil Co. and Sinclair Pipe Line Co. share ownership, will pour 12,000 barrels of petroleum products daily into North Salt Lake terminal.

FOUR CHEMICAL PLANTS BUILDING—Manufacturing Chemists Association announces that four chemical plants are being built or expanded in Wyoming at an estimated cost of $19,974,000. The chemical industry plans to spend more than $60,000,000 on expansion in the eight mountain states as part of its five-year plan to expand production facilities.

NEW ALUMINA PLANT—Construction and rehabilitation work is completed on experimental alumina plant at Laramie. Test operation of this unit will determine whether alumina can be produced at a reasonable cost from Wyoming's reserves of anorthosite, an aluminum silicate rock.

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HELPFUL LITERATURE

for the plant operator who wants to keep informed

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1

Material handling equipment guide

Arrow Products, Inc., of Grand Rapids, has a two-color illustrated folder designed to help you reduce handling costs and increase efficiency of production. This folder shows conveyors of many types and explains their installation and uses in all kinds of plants.

2

Space saving roof ventilators

An illustrated manual of roof ventilators is being offered by *American Blower Corp.* Seven models of roof ventilators are explained and the advantages of space saving, flexibility of location, safety, and reduced costs of installation and operation are examined for each. This manual is designed to help you visualize your own plant needs in terms of these models. (3704)

3

Safe, easy-rolling pallet dollies

Roll-Rite Corp. invites you to look over the advantages of their pallet and reefer dollies as contained in a new folder. The advantages of 12 standard models as to safety, versatility, and easy operation are illustrated, as well as the Roll-Rite line of industrial wheels and casters. (310-40)

4

What makes for good pump installation

Viking Pump Company is offering a reprint of an 8-page article on the problems of pump installation written by their chief field engineer. Considerable information is given on the factors which make for proper installation such as: the various interpretations and elements involved in head, viscosity of material, pipe friction, suction lift, horsepower and construction material. Tables show friction loss in standard valve and fittings and loss of head due to friction.

5

Plastic pipe pointers

The Plastic Process Co. offers three pointers on their new custom built plastic pipe. These booklets describe the wide adaptability of this product and list types and specifications available. Among the advantages of the firm's "Plasti-Pipe" are longer life, light weight, ease of installation, chemical resistance and reliability.

6

How to adapt "Cat" diesels to the job

Every owner of a *Caterpillar* diesel engine will want this 32-page booklet, prepared by the company, showing a complete selection of attachments. The booklet starts with the engine base and pictures and describes the available equipment for the cooling, fuel, lubricating and power systems of Caterpillar's 12 sizes of industrial, electric and marine diesel engines. (Form 30338.)

7

On fittings that fit

Pacific Fittings has published a pamphlet describing and illustrating pipe fittings and unions, steel pipe couplings, and pipe nipples. Illustrated are parts of the semi-automatic production line which strives to produce perfect threads on their fittings, and then protect the fittings from dirt and damage by protective packaging. (P-52)

8

Handbook on variable speed drives

Reeves Pulley Co. has published a 50-page handbook giving the complete story of the Reeves Vari-Speed Motodrive. This publication diagrams the operating principles of the Motodrive, illustrates the complete Reeves line and includes the price lists and specifications. (M-521)

9

Glass-jar battery catalog includes installation data

A new 20-page catalog has been published by *Gould-National Batteries, Inc.*, to help industrial users select and install the proper glass-jar batteries. Scale drawings and tables show steel racks in single tier, two- and three-step construction with a page devoted to a typical three-step structural steel battery rack with earthquake-proof bracing. Technical data, overall dimensions and weights are given for each type and capacity of battery.

10

Magnet reel and tagline bulletin available

McCaffrey-Ruddock Tagline Corp. now has a 16-page illustrated bulletin describing the methods by which users of traveling or overhead cranes can step up efficiency on all magnet operations. Instruction given on installation, operation and care of the company's magnet reel and tagline, as well as data on the standard tagline for use with clamshell buckets.

11

Learn about this new fork truck

The most recent addition to the SpaceMaster line of industrial trucks, Model M, is described in this *Lewis-Shepard* folder. The company claims a 40% saving in aisle space with its new truck.

12

Lighting specifications booklet

In the interest of those concerned with proper planning of lighting for industry, the *RLM Standards Institute* is offering the 1952 edition of stand-

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ard specifications. This 44-page book contains details on 18 commonly used incandescent and fluorescent industrial lighting units and two new specification pages covering high mounting porcelain enameled, and aluminum reflectors.

13

Ball bearing series described

Ira G. Perin Co. offers an engineering bulletin (52B) on MPB ball bearings, showing specifications on radial, conrad, pivot, separable magneto and angular contact series.

14

The selection, use and care of rope

A 28-page handbook on manila rope is available from *Tubbs Cordage Co.* Included in this handy publication are explanations as to the nature of the rope making process, numerous rope uses and utilization hints, as well as a complete description of types and specifications of Tubb ropes.

15

Calculator for selecting screw sizes

Standard Pressed Steel Co. has brought out a new, easy vision screw calculator, with which all dimensions can be quickly obtained for a standard screw of given diameter. Threads per inch, proper tapdrill size, body drill and counterbore sizes are given for each diameter. Obtain your calculator free by circling key number on postcard.

16

Tips on "horizontal" materials handling

A new manual featuring its line of Turret Trucks for "horizontal" material handling in every kind of industry is being released by *Hyster Co.* These trucks are low cost units for moving any material or merchandise that can be palletized, handled on skids, or loaded on a platform. All specifications and illustrations are included in this manual.

17

Facts on pumps for every use

A new catalog, published by *The Deming Co.*, contains 96 pages of illustrated information about numerous types of industrial pumps manufactured by this company. Among the diversity of types of pumps featured are centrifugal pumps including single and two ball bearing, side suction types, motor-mount types, sewage pumps and rotary pumps. Selection tables and other data of interest to pump users are included. (I-52)

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3. For complete information on **PRODUCTS ADVERTISED** in this issue, fill in page number and name of advertiser.

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21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
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41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

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18

Miniature variable speed changers described

A folder describing new miniature variable speed changers has been prepared by *The Metron Instrument Co.* This extremely small speed changer, weighing only 6 oz., is continuously adjustable and designed for wide adaptability. (99)

19

Hand pump bulletin

A new 6-page bulletin from *Blackman Pump Co.* illustrates various sizes of pumps from 7 to 28 gallons-per-min. capacity for pumping lube, vegetable or paint oils, syrups, thinners or solvents. Also shown are models used as refueling sytems for power equipment, and mounting accessories for pipeline used in plants. (HP 206)

20

On new uses of needle tubing

"Use of Needle Tubing Extended to Mechanical Applications" is the title of an article available in reprint form from the *Superior Tube Co.* Originally designed for surgical uses, new fields of application in industry have now opened up. Needle tubing made from stainless steel is characterized by high strength, stiffness and strict dimensional tolerances.

21

Allis-Chalmers describes new grommet V-belt

The "Texrope" grommet V-belt, for which 20 to 50% longer life is claimed, is described in a new bulletin released by *Allis-Chalmers Manufacturing Co.* This belt is unique in that it has no splice and is therefore cooler running, shock absorbent, and has less shrinkage and stretch. (20B6497A)

22

Guide to steel selection

Joseph T. Ryerson & Son, Inc., presents a 4-page bulletin which covers in condensed form the characteristics, mechanical properties and uses of a comprehensive list of hot rolled and cold finished carbon and alloy steel bars. Quick and easy comparison of different steel types to determine the most suitable qualities of bar steel for the job is the object of this very useful guide.

23

For more efficient loading

Penco Engineering Co. has released a specification bulletin on its magnesium ramps, both for car loading and truck loading operations. Two new Penco ramps are fully detailed and illustrated.

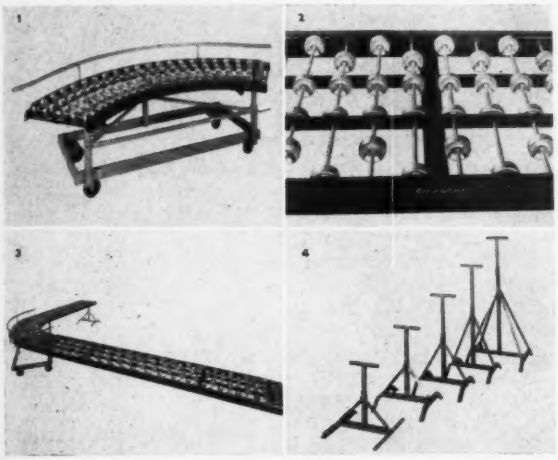
USE RIP-OUT POSTCARD for more information on products introduced this month.

NEW MATERIALS & EQUIPMENT

24

To help you save with materials handling

An outstanding feature of an outstanding materials handling equipment line is Arr-O-Wheel steel wheel gravity conveyor. Of all steel arc welded construction, 2½-in. formed channel with two center bands for greater strength, it is available in 12- and 18-in. widths. It is shown here with some accessories:



(1) Curve with adjustable guard rails, mounted on a curve portable base, comes in 3- and 4-ft. radii in various sizes, adjustable, permits pitch and banking of curves.

(2) Basic construction of sections.

(3) Straight section with curve mounted on curve portable base and "A" adjustable portable stands.

(4) Complete line of "A" adjustable portable stands for supporting Arr-O-Wheel conveyor. *Arrow Products, Inc.*

25

Automatic hardfacing process

Newly developed process, using Automatic Heliweld Head and a unit for feeding bulk tungsten carbide, grew out of a need for improved methods in depositing tungsten carbide hardfacing material on tool joints. Company affirms that tests show abrasion resistance of deposits made by this process to be greater than that attainable with other arc methods. Illustrated is the basic unit: Automatic Heliweld Head and Vibratory Hopper Assembly. *Air Reduction.*

26

Compact motor accelerates high-inertia loads

New, totally enclosed, fan-cooled, high-slip induction motor is designed for accelerating punch presses, centrifuges, etc. Firm says that Type KRX is as much as 30% smaller and 40% lighter than similar-type conventional motors. Available in 30 to 150 hp. at 900 and 1200 rpm., 5-8 and 8-13% slip. *General Electric Co.*

27

Spray applicator simplifies belt dressing

Belt-Flo belt dressing, for v drives or flat belts, is now marketed in a 12-oz. gas-pressure-type spray can. New packaging eliminates difficulties in applying regular dressing to belts under safety guards and in places that are difficult to reach—especially helpful in treating multi-v-belts and automotive fan belts. *A. W. Chesterton Co.*

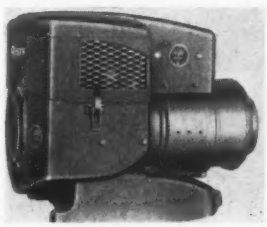
28

Corrosion-resistant alloys for welded assemblies

These new alloys for welded assemblies are said to be usable in approximately one-half or less the section thickness commonly used for similar purposes. XC54S is suited for welded ship superstructure, pressure vessels, etc. XC56S is suitable where strengths higher than those possessed by 52S and XA54S are required. *Aluminum Co. of America.*

29

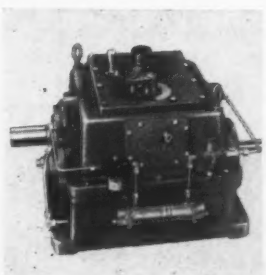
Small sized electric plant has big capacity



This 3,500-watt A.C. electric generating plant was made to meet demand for higher capacity in small-sized electric plants. Extensive tests by Onan show that it can safely draw up to 4,000 watts of power at intervals for two-hour periods. This allows extra power for peak loads of "borderline" emergency power applications. Comes equipped with heavy duty engine. *D. W. Onan & Sons, Inc.*

30

Standardized speed changers cut down waiting time



A new standardized line of gear change speed units are designed and built to eliminate high cost and delayed delivery of specially built units. These geared drives use herringbone gears throughout and provide definite ratios of speed reduction, speed increase or a combination of both. No belts to wear out and cause variations. *Philadelphia Gear Works, Inc.*

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DROP FORGINGS
Carbon and Alloy Steel, Aluminum
4000 lb. and 6000 lb. Drop Hammers
Electric Forging Furnace Facilities
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31

Power-driven roller curve eliminates conveyor line slow-ups

This unit, manufactured by *Harry J. Ferguson Co.*, is available in 90 and 180 deg. curves. It is said to eliminate slow-ups, jamming and stoppage, and maintains uniform rate of flow for conveyor line. Minimum height of unit is 18 in. Drive is a 1/3-hp., 115/230-volt, 60-cycle single-phase reversible motor with reducer and chain drive.

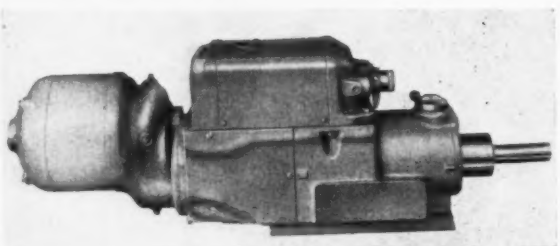
32

Spray gun for heavy-duty production

This spray painting gun, developed for application of epon resin paints, mixes a catalyst with paint a split second before it strikes surface. Both are blended after they leave gun's dual-feed head. Gun is outstanding in keeping correct balance between the two. *Binks Manufacturing Co.*

33

New air-powered hydraulic drill unit



Tailor-made for high production applications, this 19-600 drill unit features quick set-up. It is designed for heavy duty drilling, tapping, reaming, etc. A positive micrometer stop, infinitely adjustable from 0 to 6 in., controls length of stroke. *Delta Power Tool division, Rockwell Manufacturing Co.*

34

Versatile machine impregnates and laminates

This low cost, all purpose roll coating unit permits a wide variety of coating, impregnating and laminating operations. Coater will handle all types of film forming materials in dispersions, emulsions or solutions. It can be adapted to sheet coating or to continuous web coating. *John Waldron Corp.*

Use rip-out postcard for more information

35

Diesel-electric power ready for industrial trucks

There is now continuous-duty diesel-electric power for electric industrial trucks in popular 4,000-lb. fork and up to 10,000-lb. platform sizes. Ready-Power model "N" fits sit-down type fork trucks with no alterations. Unit is complete with fuel tank and starting battery. *Ready-Power Co.*

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"It certainly paid us to look in 'Classified' for a carpenter to do the job."

Whether you need a carpenter, cabinetmaker or a painting contractor, it always pays to look first in the Yellow Pages—the handy *local* shopping guide. Most everyone who sells or serves is listed in the Yellow Pages. That's why so many businessmen know, when they need a product or service, they'll find it fast in the Yellow Pages.

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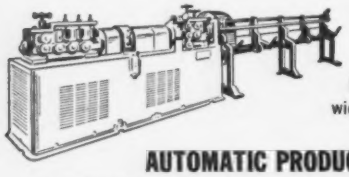

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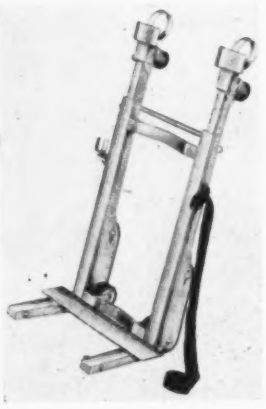
36

Tractor that can be "walked" or ridden

This tractor enables operator to "walk" with load on short hauls or ride when run is longer. Comes in two sizes with a 12- or 18-volt battery giving maximum speed of 3½ mph. Short wheel base gives small turning radius. *Moto-Truc Co.*

37

Latest equipment for appliance handling



This is a model representative of improved line of American-Keen appliance-handling equipment which includes five units made of extruded magnesium sections. This equipment is light in weight, strong, rigid in construction, and maneuverable. *The American Pulley Co.*

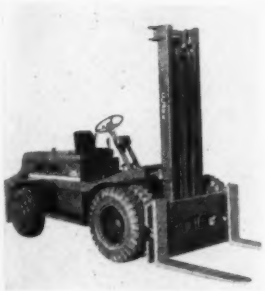
38

Hand-size transmitter for 5-mile communication range

Tiny Handie Micro-Talkie Transmitter, weighing under 2 lb., has a power output of 20 to 40 milliwatts and a tested optimum range of up to five miles. Railroad car checking, inventory control and materials handling are but a few of its uses. *Communications and Electronics division of Motorola.*

39

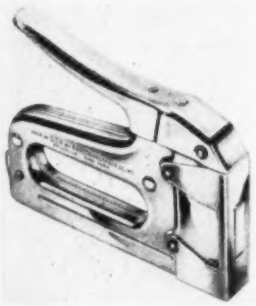
Fork truck to make out-door storage easier



Yardlift-100, with 10,000-lb. capacity at 24-in. load center, is made for heavy-duty high-tiering under difficult outdoor conditions. It is powered by a Continental engine producing 55 brake hp. at 2000 rpm. and a traveling speed of 17.8 mph. A 133-in. turning radius allows easy operation even in narrow aisles. *Clark Equipment Co.*

40

This tacker shoots heavier, longer staple



New T-50 gun tacker shoots patented wedge-pointed high gauge carbon steel wire staples up to 9/16-in. leg length. It is made to fit hand's contour for comfortable use, thus ensuring faster, easier tacking. Patented non-clogging mechanism prevents jamming or clogging of staples, according to manufacturer. *Arrow Fastener Co., Inc.*

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Surety's Sureseal Synthetic has 10 times higher abrasion resistance, 4 times higher snag resistance, much higher chemical resistance than either rubber or standard synthetics.

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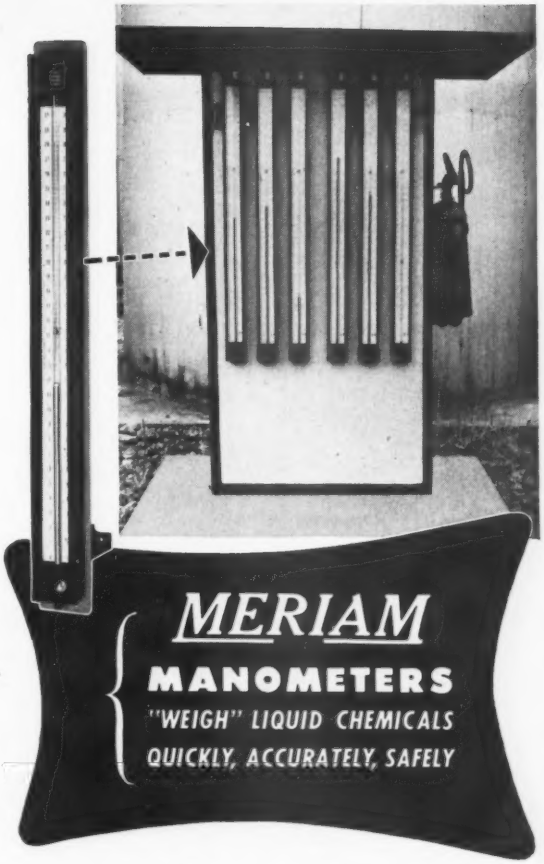

A prominent middle western chemical plant was confronted with the need to proportion, by weight, hazardous chemicals in formulating products. Personnel safety and need for immediate, exact knowledge for correct formulation, added to the problem.

Meriam Manometers provided the answer. In formulating liquid chemical products, direct weight readings are taken as various chemicals are added to the tanks. No tedious, involved mathematical calculations. No danger of injury to personnel through burning or falling. *Manometers give required information at a glance — saving time and expense.*

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☆ **3** By preventing under-coat rusting of painted products.

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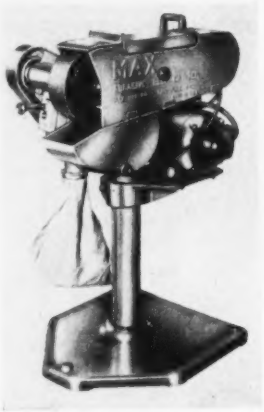
Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

41

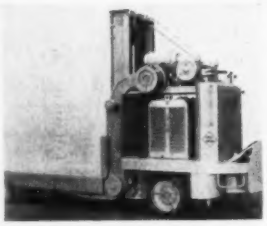
High speed grinding offered at low cost



Here is a ruggedly constructed general purpose belt grinder that will win its way in any metal working shop. Standard abrasive belts come in a wide variety of grits ranking from those for coarse grinding and snagging to fine polishing. Changing from coarse to fine grits takes only seconds. *Max Manufacturing Co.*

42

30,000-lb. capacity die puller moves machinery too



Vision, on Elwell-Parker Electric Co.'s new die pulling truck, is improved by placing operator's platform much higher than usual to bring end of platform and press base plate into full view. Electric power steering by lightweight handle improves maneuverability. Same unit, in 10,000 to 50,000-lb. models, also frequently used as load carriers and for machinery moving. *Ira G. Perin Co.*

43

New type plywood ready for market

A special panel with faces of Presdwood over a plywood core combines features of these two materials—hardness, smoothness, wear resistance, paintability and moisture resistance—plus structural qualities of thicker plywoods. Presdply is available in 4- by 8-in. panels in ½-, ⅝-, and ¾-in. thicknesses. *Masonite Corp.*

Use rip-out postcard for more information

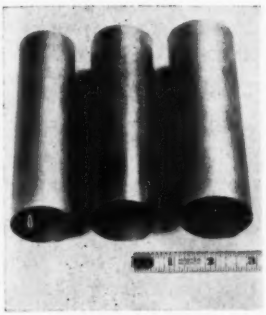
44

Fork truck with short turning radius

Stacking a 48-in. long load at right angles in a 10-ft. aisle is possible with new fork truck Model A-3444. Compact truck chassis takes care of 3,000 lb. load rating at 24-in. load center. Features include double reduction unit drive assembly. *Mercury Manufacturing Co.*

45

Larger seamless tubing now available



Seamless light-wall tubing increases in size range from 1-1/4-in. O.D. maximum to 2-1/16-in. O.D. maximum. This will enlarge number of product applications, particularly where pressures exceed limits for welded tubing. This tubing comes in three stainless analyses—AISI Types 304, 321, and 347—and in Monel metal. *Superior Tube Co.*

46

New hose for rugged usage

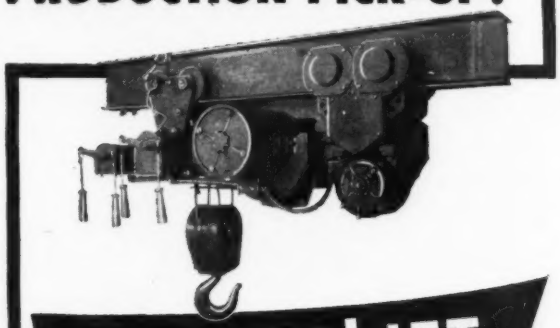
A special type of flexible, high-pressure industrial rubber hose, called Republic Wiretex, is now being produced. It is designed to carry various types of gases or fluids under both high and low pressures. Hose is not weakened by constant vibration or flexing and will not rust or corrode. *Republic Rubber division, Lee Rubber & Tire Corp.*

47

Open-mesh abrasive means faster production

When other sandpapers give up, Gritcloth keeps on cutting. Open mesh design, which allows removed particles to flow through openings, eliminates clogging and prolongs product's long, useful life. Resulting faster production and less wasted time decrease production costs. *Bay State Abrasive Products Co.*

PRODUCTION PICK-UP:



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MOTION PICTURES—

Growing popularity of color pictures has led many studios to process their own color films

THE GENERAL TREND toward color pictures in Hollywood has outrun the capacity of Technicolor to supply needs of the industry for films, with the result that two studios now have their own color methods and handle and process their own films. Technicolor still furnishes equipment.

Some of the commercial black and white laboratories are converting their facilities to take care of color work. Color costs are declining. Use of magnetic recording is on the increase, replacing photographic sound recording.

In the non-photographic side of the business, research continues to find suitable substitutes for plaster in set construction. Plaster is cheap and easy to fabricate, but it is cumbersome, labor cost of rigging it is high, and it is subject to chipping. Polyester castings were thought for a time to be a cure-all, but they have been found to be too expensive to replace plaster.

Thermosetting plastics with fibreglas reinforcement permits satisfactory props, but the cost is high and fabrication methods complicated.

The studios make practically as many molds as they do castings. Consequently, their needed requirements and their fabricating methods are quite different from those of commercial fabricators.

Use of vinyl sheets for props is increasing for helmets and armor plate. Neoprene coverings for cables have been found to be corrosion-proof and less subject to abrasion.

ELECTRIC UNIT SALES—

ESTIMATED ELECTRIC APPLIANCE UNIT SALES

for 1953, in Pacific Gas & Electric Company Territory of Service

Unit sales reported by retail outlets only, installation by residential builders not included.

(from Outlook for 1953, Pacific Gas & Electric Company)

	Estimated 1953
Room Coolers	13,750
Home Freezers	33,250
Ironers	9,770
Ranges	20,800
Refrigerators	85,510
Television	158,150
Washing Machines:	
Automatic	62,740
Non-automatic	32,610
Water Heaters	7,500
Laundry Dryers	15,500
Total	439,580

GAS UNIT SALES—

GAS UNIT SALES—1950

(Source: Gas Heat, May 1951)

	California	Eleven Western States (incl. Calif.)
Central Heating	34,595	68,790
Floor-Wall Furnaces	131,965	151,955
Space Heaters	361,850	402,180
Total	528,410	622,925
Per Cent of U. S.	23.69.	

ESTIMATED GAS APPLIANCE UNIT SALES for 1953, in Pacific Gas & Electric Company Territory of Service.

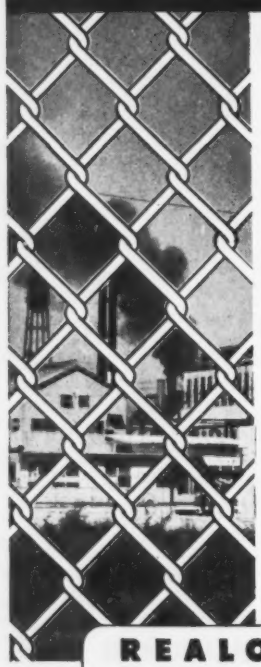
Unit sales reported by retail outlets only, installation by residential builders not included

(from Outlook for 1953, Pacific Gas & Electric Company)

	Estimated 1953	Actual 1952*	% Incr. 1953/1952
Central Furnaces	12,410	12,990	—4.5
Floor Furnaces	11,920	12,300	—3.1
Other Room Heaters	26,720	28,150	—5.1
Ranges	52,900	49,020	7.9
Refrigerators	1,840	1,950	—5.7
Water Heaters	52,330	51,470	1.7
Laundry Dryers	7,170	5,745	24.8
Total	165,290	161,625	2.3

*Nine months actual, three months estimated.

REALOCK FENCE



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We'll help you bolster your reputation for quality products by supplying precision springs that will give long, dependable service; and we'll maintain our *own* reputation for promptness by delivering them to you on time!

The next time you need springs, give us a call.

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Precision Springs and Wire Forms

METAL SHOW AT L. A.—

"Faster and better production" is the theme — More than 270 exhibitors will be represented

"FASTER and better production of metals and machinery at a less outlay of capital" will be the theme for many exhibits in the Western Metal Exposition, March 23-27 in Pan-Pacific auditorium and Pan-Pacific pavilion, Los Angeles.

William H. Eisenman, secretary of American Society for Metals, is authority for this statement. He said the exposition, as well as the Western Metal Congress to be held on the same dates in Los Angeles' new Statler hotel, will have a definite message on production and economy for industry.

Engineers on hand

Already the exposition has 271 exhibiting firms. Practically all of these, Eisenman said, will place their best engineering talent in their booths to advise and help industry over current problems.

Similarly, the Western Metal Congress will feature advanced programs by Western sections of six or more national technical societies, including American Society for Metals, American Welding Society, Society for Non-Destructive Testing, American Society for Testing Materials, American Foundrymen's Society and American Institute of Mining and Metallurgical Engineers.

Red carpets, too

In the exposition will be a large display of machine tools made in Europe and Japan, including lathes, boring mills, jig borers, radial drills, tool grinders, milling machines, chucks and centers—with many in action.

Throughout the rest of the exhibit will be metals, machines, metal fabricating equipment and methods. The show also will have testing, inspection, research, heat treating, welding, cutting and other equipment for handling metals.

Red carpeting, backed by cushiony foam-rubber to make walking easy, will be laid in the aisles. Walls will be adorned with large picture blow-ups depicting the career of American aviation for the last 50 years. An "Industrial Theater" will show late technical films.

Cooperating societies

Western sections of other societies cooperating in congress-exposition sponsorship are:

American Society of Mechanical Engineers, Southern California section; American Society of Tool Engineers; Institute of the Aeronautical Sciences, Los Angeles section; Army Ordnance Association, Army Post; Purchasing Agents Association of Los Angeles; American Society of Heating and Ventilating Engineers.

American Electroplaters Society, Society of Automotive Engineers, California Society of Professional Engineers, American Society of Civil Engineers, Structural Engineers Association of Southern California, American Society of Safety Engineers, American Ceramic Society and Pacific Coast Gas Association.

Admission easy

Admission to the Congress will be free to all. At the Exposition those holding cards in participating or cooperating technical societies will walk right in, as will recipients of special invitations issued by exhibitors. Others will be asked to register for $1.

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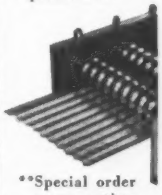

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WESTERNERS AT WORK

California

JAMES E. HOWARD, managing editor of *Western Industry* for the last three years, leaves to become publisher of *Business News Bulletin*. JOHN J. TIMMER becomes managing editor, and ROBERT S. WOOD joins staff as assistant editor.

San Diego Chamber of Commerce retains HARRY W. EVANS, JR., as industrial department manager. STEPHEN J. CHILD replaces WILLIAM C. MUELLER as manager of publicity department.

W. DON HOOPER, formerly executive vice president of *U. S. Products Corp.*, is *Hunt Foods, Inc.'s* new executive vice president. IRVING GOLDFEDER becomes chairman of executive committee.

WILLIAM H. POWELL becomes vice president in charge of manufacturing for *Macmillan Petroleum Corp.*, Los Angeles oil firm. He was formerly in charge of firm's El Dorado, Ark., refinery.

Coleman Engineering Co., Culver City, appoints C. T. LEEDS, SR., as assistant to president. He comes from Army's Los Angeles ordnance district, where he was chief of research and development division.

J. G. PETERSON is promoted to presidency of *Monadnock Mills*, 1975 First Ave., San Leandro. Firm manufactures aircraft fasteners and related items.

EDGAR SCHMUED, formerly technical assistant to president, is appointed vice president in charge of engineering of *Northrop Aircraft, Inc.* He takes over duties left by JOHN K. NORTHROP, recently resigned.

S. L. SPRAGGINS, vice president in charge of production of *Hoffman Radio Corp.*, Los Angeles, resigns because of ill health. H. LESLIE HOFFMAN, president of *Hoffman Laboratories and Hoffman Radio Corp.*, assumes duties of general director of television manufacturing. Realignment within ranks at Hoffman Radio is as follows: ARTHUR BAXTER becomes director of purchasing; MARVIN KLASSEN joins firm as buyer of television cabinets; B. L. FULLER is appointed superintendent of cabinet plant; SAM POWERS, responsible to LEN ROBERTS, supervises test and production engineering departments. At Hoffman Laboratories, HARVEY LIPP replaces ARTHUR BAXTER as head of purchasing department.

JOHN D. POTTER is appointed treasurer of *United States Steel's Columbia-Geneva Steel* division. He succeeds JOHN E. BARBER, retired.

WILLIAM PATTON joins *Pastushin Aviation Corp.*, Los Angeles, as controller.

DR. HARRY L. FISHER, president-elect of *American Chemical Society*, is appointed first director of education and research for *TLARGI Rubber Technology Foundation* of University of Southern California.

JOSEPH B. RICE, JR., becomes general manager and chairman of the board of *Beckman & Whitley, Inc.*, San Carlos, manufacturer of meteorological instruments, ballistics cameras and special instrumentation. He previously was production manager of *Beckman Instruments, Inc.*, South Pasadena.

J. B. Rice, Jr.

H. L. Rammer

H. L. RAMMER is appointed technical director for all 16 plants of *Fibreboard Products, Inc.*

DR. M. E. SPAGHT is appointed to newly-created position of executive vice president of *Shell Oil Co.* DR. HAROLD GERSHINOWITZ replaces him as president of *Shell Development Co.* of Emeryville.

American Institute of Chemical Engineers selects THOMAS BARON, *Shell Development Co.*, Emeryville, and L. G. ALEXANDER, *Oak Ridge National Laboratory*, as co-winners of 1952 Junior Award in Chemical Engineering. Award, given for outstanding contributions to literature of chemical engineering, was made on basis of a collaborative study entitled, "Momentum, Mass and Heat Transfer in Free Jets."

J. V. NAISH is elected executive vice president of *Consolidated Vultee Aircraft Corp.* J. G. ZEVELY, advancing from post of manager of contracts for Convair's San Diego division, will assume Naish's former duties as director of sales and contracts.

Gertsch Products, Inc., Los Angeles elects: LEONARD S. CUTLER, chief engineer, to post of vice president in charge of engineering; and EDWARD F. O'BRIEN, works manager, to position of vice president in charge of manufacturing.

Tea Garden Products Co. names WILLIS V. HUTH as San Leandro plant superintendent succeeding FRED C. ROBERTS. His headquarters will be in San Leandro. New position comes in addition to Huth's present job as head of firm's Oregon cold packing operations.

CHARLES H. WEBBER is named vice president and assistant general manager of *Pacific Scientific Co.* He will manage company's Southern California division.

Two new assignments are made at *AiResearch Manufacturing Co.*, a division of *The Garrett Corp.*, Los Angeles: HELMUT SCHELP is named to investigate and screen new products for manufacture; W. T. VON DER NUELL is appointed senior project engineer.

L. B. LITTRELL, H. Y. FINLEY and ARTHUR WILLIAMS are newly elected vice presidents of *Pacific Airmotive Corp.*, Burbank.

Hall-Scott Motor division of *ACF-Brill Motors Co.*, Berkeley, appoints LEONARD M. SUNDQUIST division controller and assistant treasurer. Before joining Hall-Scott, he was supervising senior auditor of *Wittman and Strachen*, San Francisco.

H. L. FARRAR, president of *Coast Counties Gas & Electric Co.*, resigns this position in order to devote more time to duties as vice president of parent firm, *Pacific Public Service Co.* He is succeeded by J. K. HORTON, chairman of Coast Counties Gas & Electric Co.

DR. STEPHEN A. PATKEY, technical director of *Production Management Engineering Associates, Inc.*, takes over additional position of vice president.

Calresin Corp., producer of hot melt polyvinyl chlorides, names DOUGLAS WILKINGS as production manager of its Arcadia, Calif., plant and C. E. HAMPTON and FRED WOODWARD as technical sales engineers.

WILLIAM HART will become secretary of newly formed *Crown Zellerbach Corp.'s* executive development committee, San Francisco. He will be replaced by E. A. PAUL of firm's Camas, Washington, division as general personnel supervisor of Crown Zellerbach with headquarters at San Francisco.

Idaho

RICHARD G. TAYLOR is named vice president and general manager of *Olson Manufacturing Co.*, Boise.

Electrolytic Coast Neutralizer

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Montana

RICHARD S. NEWLIN, New York City, is elected vice president in charge of mining operations of *Anaconda Copper Mining Co.* He succeeds CLYDE E. WEED, recently named vice president in charge of operations of company and its subsidiaries.

Nevada

Pioche Manganese Co., affiliate of *Combined Metals Reduction Co.*, names following personnel: general manager, MAX J. KENNARD; manager of Henderson plant, R. W. LOTTRIDGE; metallurgical assistant to general manager, F. R. LEONARD; and plant superintendent at Castleton operation, JAMES F. ORR.

New Mexico

Retired Rear Admiral A. E. UEHLINGER is named assistant manager of Atomic Energy Commission's Sandia Field office at Albuquerque. He succeeds GILBERT C. HOOVER, who has become manager of another field office for Atomic Commission. J. R. TOWNSEND, on leave of absence from *Bell Telephone Laboratories*, joins *Sandia Corp.* as director of materials and standards engineering. Sandia laboratory, Sandia Base, is operated by this corporation, a subsidiary of *Western Electric Co.*

Oregon

A. T. CASWELL retires from *Ames Harris Neville Co.* as vice president and manager of factory at Portland. L. W. HARRIS, JR., fills vacated managerial position.

VIRGIL HILL becomes manager of *McCready Lumber Co.*, Junction City, Ore. He replaces D. C. PECK, resigned, who now owns an interest in *Riverside Lumber Co.* in Harrisburg, Ore.

HARRY MAHONEY, manager of *United States Plywood Corp.'s* Mapleton, Ore., division, transfers to firm's veneer division at Kosmos, Wash. JOE B. MCFALL of Seattle division fills vacant position in Oregon.

EDWARD B. STANTON, Portland, vice president and general manager of *Spokane, Portland & Seattle Railway*, will rejoin *Northern Pacific* as vice president. He will headquarter at company's executive department in St. Paul, Minn.

A. C. TAYLOR becomes electrical and road foreman for *Union Pacific* with headquarters in Portland. He replaces D. G. WILLIAMS, who is transferred to Omaha, Neb.

A. T. NELSON, formerly of Tacoma, is named manager of *M & M Wood Working Co.'s* plywood division, Portland.

A. T. Nelson

W. J. VAN ARNAM retires as president of *Timber Structures, Inc.*, Portland.

Utah

K. K. HOOD becomes chief engineer of all operations of *Combined Metals Reduction Co.* He replaces M. J. KENNARD, now general manager of affiliated *Pioche Manganese Co.* in Nevada.

W. S. WAGSTAFF, president of *Western States Refining Co.*, Salt Lake City, also takes on duties of general manager. MRS. FLORENCE VALENTINE is named executive vice president and chairman of board.

G. D. MACDONALD becomes general superintendent of *Columbia Iron Mining Co.'s* iron mines. N. I. HEATON replaces him as superintendent, Iron Mountain Mine.

L. W. BRADY is made mine superintendent of *Chief Consolidated Mining Co.'s* property at Eureka. He replaces JOHN HALL, general superintendent.

Washington

K. M. ENGEBRETSEN, formerly assistant manager of Port of Longview, becomes manager of Port of Vancouver. He succeeds FRANK PENDER, resigned.

ROGER O. OSCARSON, former head of Spokane office of *National Production Authority*, is named minerals economist, division of minerals, Bureau of Land Management. His headquarters will be in Washington, D. C.

Moore-McCormack Lines makes following series of promotions: C. J. GRAVESEN is named firm's Pacific Coast manager and moves to San Francisco from Seattle; JOE BIADOS takes over Seattle office. A. C. FENGER becomes company's Pacific Northwest manager with general supervision of Moore-McCormack operations in Portland, Seattle, Vancouver, B. C., and other ports in this area.

HAROLD F. CARPENTER, assistant resident manager of *Crown Zellerbach Corp.'s* Port Angeles division, is promoted to industrial and community relations supervisor of firm's Camas division. He replaces E. A. PAUL, who will transfer to firm's San Francisco headquarters.

J. M. SMITH, JR., of *General Electric's* radiological sciences department, Richland, is appointed manager of radiological engineering. He is replaced as head of radiological standards unit by D. P. EBRIGHT,

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formerly of manufacturing department's radiation monitoring. R. L. JUNKINS is assigned to design standards liaison.

GUY HARTLE is named manager of *M & M Wood Working Co.'s* Longview plywood plant. He succeeds L. A. LUNGQUEST, resigned to join *Long-Bell Lumber Co.* as roving consultant.

ASSOCIATIONS ELECT

Colorado Dairy Products Association: President, TRUE ADAMS, *I.X.L. Creamery;* vice president, NORMAN MOE, *Arvada Dairy Co.;* treasurer, SAM ROBINSON, *Robinson Dairy Co.;* executive secretary, WARD HOLM, of Denver.

San Diego Indutries, Inc.: President, DON G. DEARTH, *Standard Iron Works;* vice president, RAY STAUFFER, *Snowflake Baking Co.;* secretary, MORTON J. LIEBERMAN, *Adaptable Store Equipment Co.;* and GEERD VON HEGERHORST, *Wilson Store Equipment Co.*, treasurer.

Western Oil and Gas Association: President, L. L. AUBERT, *Bankline Oil Co.;* first vice president, CHARLES S. JONES, *Richfield Oil Corp.;* second vice president, JOHN W. HANCOCK, *Hancock Oil Co.;* treasurer, WILLIAM REINHARDT, *Union Pacific Railroad Co.*

Los Angeles Council of West Coast Electronics Manufacturers Assn.: Chairman, EDWARD F. GRIGSBY, Western sales manager of *Altec Lansing Corp.;* vice chairman, GEORGE B. CLARK, sales manager of *Tetrad Co., Inc.;* and secretary-treasurer, DON E. LARSON, advertising director of *Hoffman Radio Corporation.*

Utah Mining Association: President, CECIL FITCH, JR., *Chief Consolidated Mining Co.;* first vice president, J. PARNELL CAULFIELD, *Kennecott Copper;* second vice president, OTTO HERRES, *Combined Metals Reduction Co.*

Western Lighting Manufacturers Institute: President, PHILLIP FREEMAN, *Sunbeam Lighting Co.;* vice president, LEONARD ROSENBLATT, *Globe Lighting Products;* secretary-treasurer, JOSEPH MARX, *Nu-Lite Fluorescent Manufacturing Co.*

Western Chemical Market Research Group: President, KENNETH BAYHA, *Commercial Solvents Corp.;* vice president, CHARLES D. THURMOND, *Monsanto Chemical Co.;* secretary-treasurer, WILLIAM Q. HULL, *American Chemical Society Publications.*

Furniture Manufacturers Association of Southern California: President, HERBERT E. TOOR, *Furniture Guild of California;* vice president, JERRY BERTRAM; treasurer, NAT MALERSTEIN.

Northwest Frozen Foods Association: President, B. T. JONES, *Pictsweet;* vice president, GILBERT LAMB, *Lamb-Weston Incorporated.*

Pacific Logging Congress officers elected for coming year are as follows: President, CLYDE CORMAN, *Weyerhaeuser Timber Co.*, Longview, Wash.; vice president, ROY A. GOULDOF, *Diamond Lumber Co.*, Glenwood Ore.; and treasurer, ROBERT F. DWYER *Dwyer Lumber Co.*, Portland.

National Association of Vertical Turbine Pump Manufacturers: President, G. F TWIST, *Peerless Pump division, Food Machinery and Chemical Corp.*, Los Angeles; secretary, B. A. TUCKER of same company.

National Paint, Varnish & Lacquer Assn.: Regional vice president for Western zone JOHN V. VAUGHN, president of *Sillers Paint & Varnish Co.*, Los Angeles.

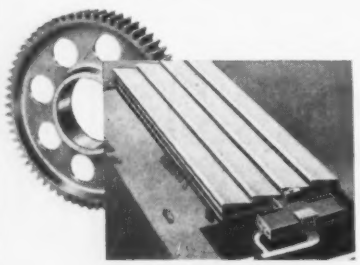
BERT SWEETING of *Meadowsweet Dairies, Inc.*, Tacoma, Wash., is elected president of *International Association of Ice Cream Manufacturers.*

NEIL NORGREN, assistant general manager of *C. A. Norgren Co.*, Englewood, Colorado, is elected vice chairman of *Council of Profit Sharing Industries.* He is elevated to this position from board of trustees on which he has served for three years.

MAX R. JENSEN, superintendent of transportation for *Consolidated Freightways*, Portland, Ore., is new chairman of *Commercial Vehicle Section of National Safety Council.*

New officers for *California Redwood Association* are: President, EARL BIRMINGHAM, president of *Hammond Lumber Co.;* vice president, RUSSELL H. ELLS, president of *Willits Redwood Products Co.*

PAUL AVESON, state manager of sales for *Texas Co.*, is elected president of *Utah Oil Industry Information Committee.*



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Chain Gear, Inc., 822 First Ave., So., Seattle, Wash.

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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

U. S. Products Corp., San Jose, Calif., appoints LLOYD C. HILSZ vice-president in charge of sales. He replaces W. D. HOOPER, resigned, who will become executive vice president of *Hunt Foods, Inc.*

S. C. Johnson & Son, Inc., Racine, Wisconsin, names following Pacific Coast region district representatives: EMIL WACHTEL, San Francisco, for San Francisco Bay Area, Northern California and state of Nevada; MEL C. PERKINS, Seattle, for Washington, Oregon, Idaho and Montana; and J. W. ANDERSON, Denver, for Colorado, Wyoming, Utah, and New Mexico. JAMES MISSIMER, Los Angeles, represents Johnson's industrial furniture waxes for state of California; and J. C. LINDBLAD, Pacific Coast industrial regional manager, to Pacific Coast from Racine to head up regional industrial division.

J. C. Lindblad

R. E. Metzger

R. E. METZGER of Denver, Colorado, is appointed manager of tubular sales for *The Colorado Fuel and Iron Corp.*, as a preliminary step to operation of a new seamless tube mill at Pueblo, Colo.

R. H. MCGOUGH is made sulfur products sales manager of *Brea Chemicals, Inc.*, subsidiary of *Union Oil Co. of Calif.*

ARTHUR L. MUNZIG, JR., is new electronic sales engineer at Pacific division of *Bendix Aviation Corp.* He will work out of firm's main office in N. Hollywood. For past two years he has been a project engineer on classified instrumentation work at Pacific division.

Ainsworth Manufacturing Corp. of Detroit appoints *Enterprise Commercial Co.*, San Francisco, as Northern California distributor for firm's steel framing system called Mult-A-Frame.

A. L. MCGILL, vice president and sales manager at *Standard Iron Supply*, graduates from Dodge School of Transmissioneering, Mishawaka, Ind., and receives a certificate of proficiency in industrial equipment field.

OTTO JANSSEN, formerly assistant manager of customer service department at *AiResearch Manufacturing Co.*, Los Angeles, becomes manager of spare parts sales.

George Davis Sales Co., Los Angeles electronic representative, takes over Southern California, Arizona and Las Vegas, Nevada, area for *Atlantic Wire and Cable Co.*, New York, manufacturer of twin-lead, antenna rotor cable, coaxial cables and wire products. Distributing company is also appointed representative in Southern California and Arizona by *Newcastle Fabrics Corp.*, New York, makers of hi-fi plastic grill cloth.

Thomas A. Steeds Co., Los Angeles, is newly appointed California and Arizona sales representative for *Multi-Hydromatic Welding & Manufacturing Co.*

Resistoflex Corp. of Belleville, N. J., appoints ROBERT E. BOWEN to head its new West Coast district office located at 633 S. La Brea Ave., Los Angeles 38.

The Girardi Bearing Co., Stockton, Calif., with branches in Modesto and Salinas, is appointed to handle *Manheim Mfg. & Belting Co.'s* line of Veelos Belting.

EDWARD L. PARSONS is named to represent *Baldor Electric Co.* of St. Louis, Mo., in sale of apparatus division products to electric motor dealers and distributors and to industrial plants for inplant use. His territory includes Northern California and Nevada.

C. A. PETERSON, technical service representative for *Oakite Products, Inc.*, in Los Angeles area, receives special scroll in connection with company's distinguished service award program from JOHN A. CARTER, Oakite president.

J. A. Carter *C. A. Peterson*

Allegheny Steel Band Co., Pittsburgh, Pa., sets up offices at 235 Montgomery St., San Francisco 4, to cover Western industrial market for its line of steel strapping and banding materials. Office is under direction of WM. G. THORN.

W. H. LEON, formerly sales representative for *American Cyanamid Co.'s* Industrial Chemicals division in Mid-West, is named Western district manager for Heavy Chemicals department. With headquarters in Chicago, he will supervise sales of the department in middle and far West.

Polymer Corporation of Pennsylvania, Reading Pa., opens an additional stocking point for Pacific Coast area to be serviced by *E. Jordan Brookes Co.*, Los Angeles.

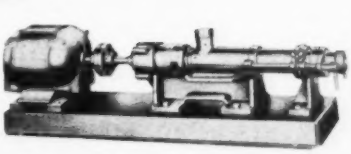
WILLIAM H. STEINKAMP is named vice president and general sales manager of *Beckman Instruments, Inc.*, South Pasadena.

Farr Co. of Los Angeles, manufacturer of air filters and air filtration equipment, appoints JOHN S. POWELL as division sales manager supervising Central division.

EDWARD O. OTTO, *U. S. Rubber Co.'s* district manager in Salt Lake City, transfers to

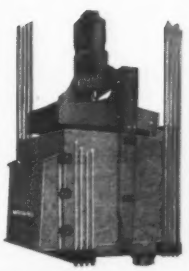
BETTER QUALITY EQUIPMENT FOR THE FOOD PROCESSING INDUSTRIES

R & M MOYNO PUMPS



This pump pumps *everything*—even highly viscous fluids, pastes, suspended solids—in uniform flow *without* pulsation. Lumpy materials are delivered with virtually no disintegration, yet with ample pressure to discharge through screens or filters. Moynos are made of all stainless steel and combine outstanding self-priming performance with *positive sanitation*. The smooth contours of the "progressing-cavity" pumping element have no crevices within which bacteria can lodge and thrive, and the entire unit may be quickly dismantled for thorough, *effective* cleaning. No other pump is like the capable, *low-maintenance* Moyno. It does everything well—works where *nothing* else will, and will save you money many ways.

COMBS SIFTING MACHINES



These machines are used for the sifting of: starch, cocoa, abrasives, alfalfa, wheat, corn, sugar, flour, and many other dry or moist materials. They are made four, six or eight sieves deep for various capacities and separations, and materials sifted can be cleaned, aerated and fluffed. The motor and all working parts being above the sieves, it is *impossible* for the material used to damage same.

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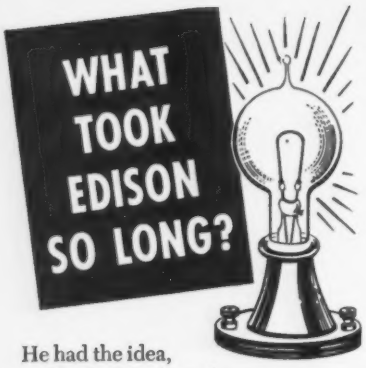

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Scotch Electrical Tapes
OHIO CARBON COMPANY
Carbon Brushes & Carbon Products
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Kansas City as manager of company's tire sales district there. M. HARVEY, assistant district manager of San Francisco tire sales district will replace Otto in Salt Lake City.

C. W. Warren Co., Los Angeles, and *Albert M. Schweitzer Co.*, San Francisco, are recently appointed exclusive factory representatives in Southern and Northern California by *General Magnetic Corp.*, Detroit, Mich., manufacturer of permanent magnets.

Pacific Scientific Co., Los Angeles, San Francisco, Seattle and Portland, is appointed sales agent for Coates electric ovens, made in Seattle.

Palmer Supply Co., Seattle, is appointed a franchised distributor of industrial tube fittings and tube fabricating tools manufactured by *The Parker Appliance Co.* of Cleveland.

CARL E. SWIFT, Los Angeles, is appointed distributor of Specialty Tool Steel products for *Jessop Steel Co.*, Washington, Pa. He will handle ground flat stock and high speed tool bits.

Smith-Blair, Inc., manufacturer of waterworks supplies, appoints F. F. OSBORNE its general sales manager. His headquarters will be at Smith-Blair's main office and factory in South San Francisco. He will supervise firm's branch warehouse and sales organization at Downey plus distributors and jobbers of firm's products throughout United States and Canada.

JOHN FINN, former steel department manager of *Triangle Steel Products Corp.*, joins *Drake Steel Supply Co.* as sales manager with headquarters in Los Angeles.

EDWARD L. PARSONS, 600 16th St., Oakland, is appointed factory representative for Northern California in the sale of Brammer "V" link belting.

General Electric Supply Co., Los Angeles, promotes PAUL L. HERBERT, formerly lighting specialist, to position of sales manager of its builder department.

Watson & Meehan, Cummins Diesel dealer for Northern California and Nevada, opens a new parts store at 1127 Parkview Ave., Redding, Calif.

WALTER H. OSTRING returns to former office location at 1149 E. Pico Blvd., Los Angeles. He is exclusive representative for *W. A. Jones Foundry & Machine Co.; Lovejoy Flexible Coupling Co.; Gits Bros. Mfg. Co.; Vacuum Engineering Corp.*, and *Wonway Clutch Co.*

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Dillon Stevens & Co., manufacturers' representative, acquires long term lease on new office and warehouse building at 1345 Venice Blvd., Los Angeles. Building provides ample space for a modern engineering department, offices and storage space.

CHARLES W. BAKER, formerly Milwaukee district manager for *Chase Brass & Copper Co., Inc., subsidiary of Kennecott Copper Corp.*, is appointed Western regional manager with headquarters in Los Angeles. He will supervise Chase sales operations in eleven Western states.

National Records Management Council establishes offices in Russ Bldg., San Francisco 4. Resident officer is ALAN G. NEGUS.

ELLIOTT A. ALLEN, Los Angeles, is now Pacific Coast manager of *New Hampshire "Micro" Ball Bearings, Inc.*

Columbia-Geneva Steel division, United States Steel, San Francisco, promotes JAMES B. BLACK, JR., to manager of bar and semi-finished product sales, and SHANE LLOYD-BUTLER to manager of plate and structural products sales.

Samson Sales Co., San Francisco, is named to represent Nevada and N. California interests of *Everson Manufacturing Co.*, Chicago, water chlorinating equipment maker.

The American Pulley Co., Philadelphia, Pa., appoints *Howard Burt & Sons* of San Francisco distributor for company's pressed-steel hand trucks and industrial wheels.

The Rucker Co., specialists in fluid power systems, moves its Southern California offices into larger quarters at 4956 Firestone Blvd., South Gate.

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1—323A Denver Fire Clay Laboratory Melting Furnace (3000 degrees F.) & 8—#12 Crucibles. 1 Tong & 1 Shank. Used for 10 melts—Cost $387.00.

1—DeSpatch Core King Jr. Core Oven with 8 shelves. Brown automatic controls used slightly—Cost $858.00.

6—Ingot Molds, Size "O"—Cost $33.00.

1—Ton Herculoy Gear Bronze Ingots—Cost $804.00.

1—Ton Almag 35 Aluminum Alloy Ingots—Cost $624.00.

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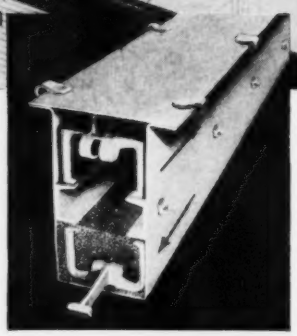

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